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THE

ENTOMOLOGICAL

MAGAZINE.

VOL. I.

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FREDERICK WESTLEY AND A. H. DAVIS,

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" The noblest employment of the mind of man is the study of the works of his CREATOR.

" To him whom the science of nature delighteth, every object bringeth a proof of his GOD: and every thing that proveth this giveth cause for adoration.

" His mind is lifted up to HEAVEN every moment; his life is one continual act of devotion.

* * * * * *

" Thou who seest the whole as admirable in parts, canst thou better employ thine eye than in tracing out thy CREATOR'S greatness in them; thy mind, than in examining their wonders?

* * * * * *

" Wherein is knowledge but in the study of nature?

* * * * * *

" All other sciences are vain; all other knowledge is boast; lo! it is not necessary or beneficial to man, nor doth it make him more good or more honest.

" Piety to thy GOD, and benevolence to thy fellow-creatures, are they not thy great duties? What shall teach thee the one or what shall inform thee of the other, like unto the study of His works?"

Economy of Human Life.

Smithsonian Institution
AUG 27 1900
National Museum

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2 & 3. Allantus Scrophulariæ. (larva).
4. Lyda sylvatica. (larva).
5. Crœsus septentrionalis. (larva).

PLATE II.—*See* ART. XXV.

Ephemera marginata. (larva).

Fig. 1. *a*. The great dorsal vessel.
b. The point at which the great dorsal vessel curves inward and is lost to the view.
c. The lateral vessels which convey a portion of the blood from the anterior to the posterior end of the body.
d. Some of the points at which a part of their contents is discharged into the great abdominal cavity.
e. The point at which they terminate, discharging their contents into the great dorsal vessel.

Fig. 2. A portion of the great dorsal vessel.
a. Appendages, supposed to be nervous ganglions, situated above and beneath each set of valves.
b. The valves at the commencement of the expansion of the artery, when the blood is seen converging towards them from all points, and flowing through them into the upper portion of the artery.
c. The exterior portion of the artery, connecting the parts above and below the valves.

Fig. 3. A portion of the vessel in a state of collapse, with all the valves closed.
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c. The exterior portion of the artery, as seen in Fig. 2, *c*.

Fig. 4. A portion of the vessel in its greatest state of expansion.
a. The lateral openings closed, while the main current of the blood is passing up the vessel.
c. The exterior portion of the artery as seen at *c*. Figs. 2 and 3.

Fig. 5. A single compartment of the great dorsal vessel in its greatest state of collapse.
Fig. 6. The same portion of the vessel in its greatest state of expansion.

PLATE III.—*See* ART. XLVI.

Fig. 1. Sphinx Ligustri. (larva).
2. Biston Betularia. (larva).
3. Tipula oleracea. (larva).
4. Trichiosoma lucorum. (larva).
5. Ichneumon instigator. (larva).
6. Anthia 6-maculata. (larva). Copied from Guerin.
7. Trogosita Mauritanica. (larva).
8. Blatta ————————? (larva).
9. Cicada Fraxini. (pupa).
10. Perla bicaudata. (larva).

PLATE IV.

Fig. 1. Tabanus bovinus. (imago).
2. Sirex nigricornis. (imago).
3. Hydrous piceus. (imago).
4. Acridium bipunctatum. (imago).
5. Pentatoma dissimilis. (imago).
6. Ægeria Apiformis. (imago).

(In this Plate the shaded portion is the mesothorax).

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C. *D*. Prothorax . . 2*d* ditto.
E. *F*. Mesothorax . 3*d* ditto.
G. *H*. Metathorax . 4*th* ditto.
I. *J*. Propodeon . . 5*th* ditto.
K. *L*. Podeon . . . 6*th* ditto.
M. *N*. Metapodeon . 7*th* ditto.
O. *P*. Octoon . . . 8*th* ditto.
Q. *R*. Ennaton . . 9*th* ditto.
S. *T*. Decaton . . 10*th* ditto.
U. *V*. Protelum . . 11*th* ditto.
W. *X*. Paratelum . . 12*th* ditto.
Y. *Z*. Telum . . . 13*th* ditto.
a. Propes . . . Fore-leg.
e. Proala . . . Fore-wing.
i. Mesopes . . Middle-leg.
o. Metala . . . Hind-wing.
u. Metapes . . Hind-leg.

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THE

ENTOMOLOGICAL MAGAZINE.

SEPTEMBER, 1832.

INTRODUCTORY ADDRESS.

In the present advanced state of the science of Entomology, it may be regarded as a little singular that no distinct periodical publication, exclusively devoted to its general interests, has hitherto appeared in this country.

It is true that the Zoological Journal, and the Magazine of Natural History, have partially supplied this deficiency; but the few papers which could be admitted on any one branch of Zoology into the former, combined with the irregularity of its appearance; and the very general character of the latter, which excludes strictly scientific articles; are reasons amply sufficient to justify the present attempt to establish a Magazine, which shall be wholly devoted to Entomology.

The projectors consider themselves as possessing a strong claim on the support of all the lovers of Entomology, having undertaken the work without the slightest expectation of pecuniary advantage to themselves, but with a disinterested desire to promote the progress of a science to which they confess themselves zealously attached. They contemplate no profit, and all their anxiety is, that it may receive sufficient support to guarantee them from actual loss.

The scientific Entomologist has frequently had occasion to regret the want of an appropriate medium through which his researches might gain public attention. Hence we find interesting Entomological papers scattered in magazines of a purely literary or philosophical character,* or lost in the unreadable and cumbrous tomes of learned societies, where they are rarely consulted, and are often entirely overlooked. We might cite instances of this kind; for example—the admirable monograph of Mr. Kirby on the Genus Apion, and that of Mr. Spence on Choleva, in the Linnean Transactions. No one thinks of expending two guineas in the purchase of these volumes for the sake of a single paper, however excellent, and access to them is thus confined to a few. From this cause, we are satisfied that many valuable contributions to Entomology have been suffered to remain within the portfolios of their authors; few individuals choosing to incur the risk of a separate publication, with the knowledge that the sale of such works is extremely limited. We are also disposed to think that the want of an appropriate vehicle for imparting information has tended, in many instances, to repress that spirit of inquiry which is so highly desirable in the pursuit of science. These difficulties will now be removed;—the pages of this magazine will be open to record the labours of British Entomologists, which have been as yet imperfectly known.

The facilities for spreading information which Foreign Entomologists have long enjoyed, have given them a decided superiority and advantage in cultivating the science. We are convinced that our own countrymen will not be slow to avail

* An instance in point has just come under our notice. In the London and Edinburgh Philosophical Magazine and Journal of Science for the month of August, there is a paper by J. O. Westwood, Esq., giving characters of two families, including sixteen genera of Hymenopterous insects, which, from being published in such a channel, are never likely to be seen by Entomologists.

themselves of the channel now afforded them, and that their industry and ability need only to be known to be fully appreciated: for we know there are manuscripts in existence, the result of years of laborious investigation, which would contribute to extend the science, and do honour to the unwearied, patient, and talented efforts of their possessors.

The plan of the projectors is to produce a magazine which shall contain Illustrations of the Habits and Metamorphoses of Insects,—Descriptive Characters of New Genera and Species,—Records of the Capture of Rarities,—Reviews (with extracts) of all new Entomological works,—and information of every kind connected with the science of Entomology. The present number will, it is hoped, as a precursor, be no unworthy pledge for the future; and will exhibit, in the variety of its subjects, our disposition not only to provide papers of scientific importance, but also those of a more popular character.

The cordial and unsolicited promises of support which this undertaking has received from the principal Entomologists of the United Kingdom, demand our sincere thanks; while they convince us still more of the necessity which exists for its appearance. In the prosecution of our design, we shall be happy to receive contributions from any authentic sources, either in Latin, French, or English, as it is not our intention to confine ourselves to British Entomology, but to embrace the whole circle of the science.

In addressing ourselves more particularly to Foreign Entomologists, we trust they will be disposed to aid our efforts, by forwarding their works, that we may be able to notice them immediately on their appearance. It will give us pleasure to introduce them to the numerous Entomologists of our islands, who, at present, have no adequate means of becoming acquainted with them.

Our anxiety will be to render the ENTOMOLOGICAL MAGAZINE a vehicle by which the labours of British and Foreign Entomologists may be speedily communicated, and thus, in some degree, prevent the recurrence of that confusion in the nomenclature of the science, which naturally results from authors, at a distance, being unacquainted with each other's proceedings.

The second number of the work will appear on the 1st of January, 1833, and will be subsequently published quarterly, on the 1st of March, July, and October. Should it appear necessary for the elucidation of generic distinctions, plates will be occasionally given, provided the sale of the work at all justify the expense.

None can regret more than ourselves that the spirit of party should pervade the walks of science. It is a reproach to philosophy and natural history, that their most distinguished advocates are not at peace among themselves; and that, in their researches after truth, they are too apt to allow selfish feelings to predominate, forgetting that the cultivation and extension of all knowledge is best accelerated by the exercise of candour and generosity. We therefore avow our determination to avoid, in this work, all illiberal or personal allusions, in referring to authors whose labours entitle them to our respect. With empirics and pretenders to science we can have no feeling in common;—justice to our readers will, in such cases, claim from us an unshrinking discharge of duty.

We now appeal to all who are desirous of encouraging this work, to remember that its permanent utility and success must be the result of individual effort. We look with confidence to those who possess information; and we trust that every Entomologist will feel gratified not only in giving us his personal support, but also his warmest recommendations.

ART. I.—*Abstract of M. Straus-Durckheim's "Considerations Générales sur l'Anatomie Comparée des Animaux Articules."* By EDWARD DOUBLEDAY.

> "Lusimus, Octavi gracili modulante Thalia
> Atque ut araneoli tenuem formavimus orsum
> Posterius graviore sono tibi musa loquetur
> Nostra."

IN attempting to give a brief abstract of this admirable work, I cannot but feel how incompetent I am to do justice to such a subject. The task would not be an easy one for him who had drank deep at the fountain-head of science: for me, who, Hylas-like, have wasted my time with the lilies and poppies on the margin, it is almost an impossibility.

However, in these book-making days, when a knowledge of his subject is the last thing an author thinks of, as we have of late seen, more than once, in the publications of a certain *learned* professor, it may not be thought very great presumption in me to attempt a few pages, on a subject to which I have paid some little attention.

Before I proceed further, it may be well for me to explain the plan which I shall pursue. In the first place, I shall translate a very considerable portion of the Introduction, in the author's own words, as nearly as possible: of the rest I shall give as succinct an abstract as I can, without rendering it obscure. In all cases in which it is not otherwise specified, it may be considered, that the opinions expressed are those of M. Straus-Durckheim: wherever I venture an opinion of my own, it will always be duly marked, unless the context sufficiently shows to whom it belongs.

The remainder of the volume I shall pass over more lightly, only touching on the most important parts, and omitting those which are more generally known, or are less interesting in a scientific point of view. I am sorry to be compelled, as I often shall be, to omit much valuable matter; but to extract all worth extracting, would be the same thing as translating *verbatim* the whole work.

There is one remark in the Preface to which I cannot but refer, it being one we ought always to bear in mind when

engaged on the important subject of classification: it is this—those genera which form the connecting links of the principal divisions, offer, mostly, a very simple organization, which scarcely teaches us anything of the structure of the families which compose those divisions.

In the Introduction, the author endeavours to explain the laws which regulate the different changes of structure in passing from one group to another.

The most general law which we recognize in the organization of animals is, that all the systems of organs* ("*appareils*") are subjected to a constant variation of form, and even of function, in passing from one family to another.

In these changes, the organs mostly follow a gradation, by which they arrive at a more perfect or imperfect state, according to the plan which the Supreme Intelligence has ordained in the creation of beings. Upon this depends the classification of animals, at least the classification according to the System of Nature.

But however clear this law may be, in vain has been any attempt to detect the principles on which it reposes; and the many different systems of classification which have been proposed, show how great a diversity of opinion prevails on this subject. But is not the principal cause of these varying opinions, this—that most naturalists have founded their systems on the supposed preeminence of some *one* particular organ, or set of organs; whilst no system can be in accordance with nature, which does not rest on a consideration of the *whole*, and on the greater or less degree in which each one influences the other parts of the body?

Observation shows us that this general law is modified: 1. According to the functions which the organs have to perform: 2. According to the circumstances in which they are placed, with regard to one another: and, 3. According as the organs are, more or less, under the influence of external causes.

Consequently, this general law is divided into several particular laws (*lois particulières*). To the examination of such of

* I do not know how far I am correct in using this expression to convey the same idea as the word "*appareils*," but I have been compelled to employ it, not knowing any word in our language which conveys the precise meaning of the French term.

these as are common to all the organs, M. Straus-Durckheim next proceeds, leaving the others to be examined in those parts of the work in which each system is treated of separately.

First Law.—The organs, at one extremity of the scale, exercise always a very evident function; whilst, at the other extremity, they are constantly rudimentary and without function, and at last disappear.

We may here distinguish two cases. In the first, the organs present themselves at the head of the scale, developed to the highest degree of which they are susceptible, and decrease insensibly, until they arrive at the other extremity of the scale. Thus, for example, the posterior wings of insects are introduced suddenly into their organization at the highest point of perfection in the Coleoptera, where they alone serve for flight. In the Orthoptera and Hemiptera, they already begin to divide their function with the elytra; and go on diminishing gradually, until they exist merely as rudiments in the Diptera, where they are represented by the Halteres: finally, they entirely disappear in the Aphaniptera.

In the second case, the organs do not appear at the head of the scale in their most perfect state of development, and only acquire it by degrees. Such is the case with the elytra, or first pair of wings, which follow a course exactly contrary to the inferior wings. They only appear, at first, as organs slightly accessory to flight. In this state they remain nearly throughout the whole of the Coleoptera. In the Orthoptera and Hemiptera, they begin already to take a very active part in flight, but still preserve their primitive use. In the Neuroptera, particularly the Libellulina, they attain the development of the anterior wings, from which they differ but very slightly. From this point, they continue to surpass them, until, in the Diptera, they become the sole organs of flight, and, of course, have attained their highest degree of perfection. Arrived at this culminating point, they suddenly diminish in Hippobosca, and entirely disappear in Pulex.

Although, in this last case, the organs present their most perfect degree towards the middle of the scale, and decrease towards each extremity; yet, they never are found at the head of the scale in that state of perfect nullity which can properly be called rudimentary, but serve, more or less directly, for the function to which they are destined.

Second Law. — In those organs which form series on the same animal, the gradation is commonly double: that is to say, on the one hand it is relative to the succession of genera and families; on the other, it is relative to the rank which each pair occupies on the body of the animal.

This is exemplified in the feet; the rudiments of which appear in Lombricus without any articulation, as mere cirrhi, and buried in the skin. These soon become external; and in Nereis and Aphrodita are furnished with a number of muscles, are evidently articulated, and become organs of reptation already very perfect. Lastly, in the Myriapoda, the integuments are become solid, the feet present well-defined articulations, but the pieces of which they are composed are all nearly similar; and it is only when we arrive at Dorsigera, that we find the feet assume the form so conspicuous in insects.

Arrived at the Myriapoda, the feet decrease in order of rank. The posterior diminish (*s'atrophient*) in passing to Lepisma, where the greater number are only rudimentary; the three pair belonging to the three segments of the trunk retain their usual form, and maintain it to the end of the Class Insecta.

Already, in Scolopendra, the last pair of legs, though much stronger than the others, no longer serve for locomotion; and in Lepisma they are changed into the long filaments at the extremity of the abdomen, which are again found in some Orthoptera and Neuroptera.

In the Crustacea, the feet likewise undergo a change of this nature; but as they also experience a change of function, they will be spoken of as examples of the next law.

Third Law.—The organs often change function to replace others which disappear.

It is very rare that nature introduces a new organ, if another, become useless, can fulfil the same conditions. This admirable economy is remarkable, even in the forms which are preserved as long as possible; and the parts of the first system (*appareil*) which no longer are of service to the new function only, disappear gradually, by becoming more and more rudimentary. These parts, which are then as it were superadded to the organs, serve very advantageously to recognize the primitive use of these last.

Of this, the feet again serve for an example: in Aphrodita they are all locomotors; whilst in Scolopendra the first pairs

begin to tend towards the head, following a degradation in order of rank, to transform themselves into masticatory organs.

On the other hand, the posterior feet, which are maintained as locomotive organs amongst the Myriapoda, instead of disappearing amongst the Crustacea, as in the Insecta, are transformed successively into organs of respiration, commencing with the last pairs: and, advancing more and more towards the anterior pairs, we find that, in the Stomapoda, there exist but three pairs of legs capable of walking, whilst the others are changed on the one hand into the organs of the mouth; on the other, into organs of respiration. Amongst the Branchiopoda which terminate the Crustacea, all the feet, with the exception of a single pair, become branchiferous, and the only one which has not undergone this transformation is of no service in walking, but only in swimming. Lastly, in the Cirrhopoda, no pair of feet serves for progression, but simply for prehension, and it is probable they fulfil also the functions of branchiæ.

The feet in Gammarus present us with a remarkable instance of this change of function. The anterior are transformed into jaws; the following become chelate legs (*pieds machoires*), and serve for prehension. Of the middle pairs, the anterior remain ambulatory, the posterior serve for swimming, whilst the hinder pairs are transformed into branchiæ.

Fourth Law. — When the function demands a greater complication in the composition of the organ which has to perform it, this last acquires it successively, by parts, which are added at first under the form of rudiments.

These rudiments are further developed in other species, or in other pairs of the same organs, so that these have often undergone a very considerable change of form, before it becomes probable that they have changed function: this is particularly remarkable in the feet of Crustacea, which, from ambulatory organs, become branchiferous.

Fifth Law. — The same functions may be exercised by very different systems of organs (*appareils*).

In all circumstances where Nature could not preserve an organ, or system of organs; whether that it could not accord itself with the rest of the organization of the animal, or that, after the degradation it had undergone, it had disappeared, whilst it was necessary that its functions should be preserved;

we see, then, a new set of organs employed for this function, although it often fulfils another. Thus it is, that in Limulus, where the whole head, and consequently the organs of the mouth, have disappeared, mastication is performed by the feet, which, at the same time, serve as organs of progressive motion.

Sixth Law. — When one organ governs one, or many others, these follow the march of the dominant organ; and when at length this disappears, those which were subordinate to it retake suddenly their primitive form.

It is principally by this law, that we can recognize whether an organ, which is wanting in a species, has disappeared by the effect of its degradation, or is wanting by a merely specific imperfection (*simple avortement specifique*). In this last case, all that was exclusively subordinate to that organ remains in exactly the same state as if it still existed; and more especially if the subordinate organs have already undergone a considerable transformation by the effects of the law of variation to which they were submitted, whilst the dominant organ was acting upon them, and that they would be obliged to undergo too great a change to return to their primitive form.

This law is shown most remarkably in the influence of the wings on the thorax. In proportion as the two pairs of wings change in form and size, the two segments of the thorax which support them follow the same progression, and become more and more united to one another; but no sooner do the wings disappear in the Aphaniptera, than the two segments of the thorax regain their primitive form, are separated from one another, and again present the same appearance as in Lepisma.

The wings being first introduced amongst the Coleoptera, and the thorax of these as yet differing but little from that of the Thysanura, it can easily return to the form it possessed previously to its undergoing any modification. It follows thence, that, in those species which are deprived of wings, the thorax returns more or less to its primitive form. This is particularly remarkable in the females of many species of Lampyris, which possess neither wings nor elytra: and this return is moreover occasioned in the Coleoptera, without wings, by another cause, which acts, in this case, on that part of the body; it is the diminution of the solidity of the integuments in those parts which are covered by the elytra.

In the other orders of insects, the two segments which bear the wings having already experienced a very considerable change of form, it would require a more powerful cause to bring them back to their primitive form: for this reason, the return does not take place in Cimex celularius, the Formicæ, &c., amongst which the imperfection is only specific. In the Aphaniptera, on the contrary, which we may consider as wingless Diptera, the transformation of the thorax takes place in consequence of a complete absence of the wings, brought about by the degradation which these organs have experienced in passing through the whole of the Class Insecta.

Seventh Law.—The form of many organs of the vertebrata is generally in accordance with certain exterior agents, to which they are connected by their function: in the Annulosa, this dependence is less rigorous, and sometimes even insensible.

Thus, in the former, the form of the teeth depends on the species of aliment on which the animal feeds; whilst, in the latter, the organs of the mouth do not so rigorously follow the same law, being often under the influence of a second function, which modifies them, and causes them to appear anomalous. For example; we find in insects, carnivorous and herbivorous species, which offer a very great resemblance in the masticatory organs. In the Coleoptera, those which are the most carnivorous, such as the Carabi, the mandibles are commonly elongate, and armed with very strong teeth, which serve them as well to seize as to tear in pieces their prey; whilst their maxillæ and labium are small and feeble.

These characters are again found equally in Lucanus, which lives only on the sap of trees; but in these, the mandibles serve more particularly for defence. Other insects offer, in this respect, anomalies quite as remarkable.

The aquatic habits of many insects often influence but slightly the conformation, either of the whole body, or the feet only. Insects never being entirely aquatic in the perfect state, but only amphibious, it is not surprising that the feet of those which commonly reside in water differ often but slightly from those of the terrestrial species; the form which they commonly have, not being incompatible with the element in which the insects reside. But the Crustacea, which are almost all aquatic, offer very often, in their feet, forms which are nowise in

accordance with the medium in which they reside. For example—the greater part of the Decapoda Macroura are in no respect adapted for swimming; and amongst the Isopoda, the Ligiæ, which are marine, and the Onisci, which are terrestrial, present no sensible difference of structure. The Hydrachnæ, also, offer no character which indicates their aquatic habits.—*(To be continued.)*

Art. II.—*Monographia Chalcidum.* By Francis Walker, Esq. F. L. S.

In the variety of their forms, the brilliancy of their colours, and probably the number of their species, the Chalcides excel every other family of insects. Very few have been described, except the species of Encyrtus, by Dalman, to whom, and Spinola, we owe the little information we possess. They may be divided into two primary groups, to which the names Pentameri and Tetrameri are applicable, from their five or four-jointed tarsi. The tetramerous tarsi have been noticed by Mr. Curtis in describing the genus Eulophus: the species of this division are usually smaller than the Pentameri; their bodies are softer; their colour less generally metallic; they run faster, but do not leap so far.

Section I.—Chalcides Pentameri.

Tarsis quinque-articulatis.

Family I.—Eurytomidæ.

Type.—Eurytoma. *Illiger.*

Caput transversum: oculi laterales: ocelli in triangulum dispositi: *maris* antennæ 11-articulatæ, setaceæ, filiformes aut clavatæ: *feminæ* antennæ 12-articulatæ, clavatæ: mandibulæ apice angustiores, tridentatæ: maxillæ elongatæ: mentum elongatum, quadrangulum: labium basi angustum, anticè sinuatum: palpi maxillares articulis 3 aut 4: palpi labiales biarticulati: thorax gibbus aut cylindricus: prothoracis[a] scutellum magnum, subquadratum: mesothoracis scutellum benè determinatum suturis duabus lateralibus, scutum convexum ovatum, paraptera triangula: metathoracis præscutum angustum, scutellum magnum

[a] In describing the parts of the thorax, I have adopted Mr. MacLeay's nomenclature.

canaliculatum: abdomen cylindricum aut gibboso-compressum, petiolatum, segmentis 7: aculeus subexsertus: coxæ magnæ: femora subclavata: tibiæ apice spinis duabus armatæ: tarsi 5-articulati, articulo primo longiore, sequentibus longitudine decrescentibus: ungues arcuatæ.

In external appearance, this family seems to have many affinities with Smiera, Chalcis, and Haltichella, to which, with Dirhinus, *Dalman*, and Chirocera, *Latreille*, I propose restricting the term Chalcididæ. They and the Eurytomidæ differ from the rest of the Chalcides in their large quadrate proscutellum or collar, which is noticed by Dalman as the distinguishing character of Eurytoma. The trophi, however, of these two families are very different, and the Eurytomidæ may be easily known by their smaller coxæ, more slender thighs, and less arcuate tibiæ. Dalman remarks of Spalangia, which he places next to Eurytoma, that it resembles it in habit; but that the form of the head is totally different. Cerocephala, *Westwood*, may possibly be an intermediate genus, between which and Spalangia, the only apparent external difference consists in the horned head of the former: perhaps the stigmal branch of the anterior wing varies slightly. Another genus, as yet undescribed, one species of which is common on box-trees, in the spring, is closely allied to Eurytoma longula in habit, though its biarticulate palpi bring it near to Spalangia. The colour of all the Eurytomidæ I have seen is black, sometimes variegated with yellow or red, without any metallic hue, in which they resemble the Chalcididæ. They are usually found in marshy places, or in the vicinity of ditches. The species of Decatoma, however, are found in woods beneath oak-trees, &c. I have been informed by Mr. Davis, that he has obtained an individual of the latter genus from an oak-gall. This fact shews it to be similar to the Torymidæ in economy, one genus of which, Megastigmus, it also resembles in structure.

Characteres Generum.

Abdomen
- cylindricum: *Corpus*
  - elongatum, gracile: *fem.* antennæ apice rotundatæ . . 1. Isosoma.
  - breve, crassum: *fem.* antennæ apice acuminatæ . . . . 2. Systole.
- compressum. *Antennæ*
  - *mas*, setaceæ verticillato pilosæ: *fem.* clavatæ . . 3. Eurytoma.
  - *mas*, et *fem.* clavatæ . . 4. Decatoma.

Genus I. Isosoma,[b] *Walker.*

Caput medium: palpi maxillares 4-articulati: *maris* antennæ 11-articulatæ, pilosæ, filiformes: *feminæ* antennæ 12-articulatæ, pilosæ, submoniliformes, clavatæ: thorax convexus: abdomen cylindricum.

* *Abdomen ovatum, cylindricum, non compressum.*

† *Corpus omnino nigrum.*

Sp. 1. Isos. atrum. Fem. *Nigrum, alis subfuscis.*

Caput, thorax, et petiolus obscuri, punctati: abdomen nitidum, glabrum: oviductus apice fulvus: antennæ basi fuscæ: tibiæ nigro, tarsi pallidè, fusci: genua tibiarumque apices flavi: alæ subfuscæ. (Alarum longitudo, 2 lin.)

Dull black, pilose: eyes and ocelli black: abdomen smooth, shining, very finely punctured, pilose toward the apex: petiole dull black: punctured apex of the ovipositor yellow: antennæ rather thick, in length equal to one-third of the body, club short, base of the first joint fuscous: legs black: tibiæ dark fuscous, pubescent: tarsi pale fuscous: knees and extremities of the tibiæ yellow: wings slightly fuscous, nervures darker.

July; grassy banks; Southgate.

†† *Prothoracis latera anticè maculata.*

Sp. 2. Isos. longulum. Mas et fem. *Nigrum, prothorace anticè maculis duabus pallidè rufis, alis subfuscis.*

Eurytoma longula. *Dalman.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus pallidè rufis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: oviductus apice flavus: antennæ basi fuscæ: tibiæ nigro, tarsi pallidè, fusci: genua tibiarumque apices flavi: alæ subfuscæ. (Alarum longitudo, 2—3 lin.)

Var.—Ocellus anticus rufus.

Dull black, pilose, punctured: eyes and ocelli black, the anterior ocellus sometimes red: the sides of the proscutellum have each a pale red spot on their anterior margins: the abdomen is smooth, shining, very finely punctured, slightly

[b] Ισος, *equalis*; σωμα, *corpus*.

pilose toward the apex: the tip of the ovipositor is yellow: the antennæ are black, the base of the first joint fuscous: the antennæ of the male are as long as three-fourths of the body, those of the female are much shorter: the thighs are smooth and shining above, beneath dull, punctured: the four posterior tibiæ are dark fuscous, the anterior are paler, yellow beneath: the knees and extremities of the tibiæ are yellow: the tarsi are fuscous, the anterior darker than the four posterior: the wings are slightly fuscous, the nervures darker.

This species is common at Southgate, amongst grass on the banks of ditches, in the months of March, April, and May.

Sp. 3. Isos. fumipenne. Fem. *Nigrum, præcedenti brevius et crassius, prothorace anticè maculis duabus pallidè flavis, alis fumosis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus pallidè flavis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: oviductus apice flavus: antennæ basi fuscæ: tibiæ tarsique fusci: genua tibiarumque apices flavi: alæ fumosæ. (Alarum longitudo, 3 lin.)

This species is shorter and broader than the preceding, which it much resembles: the wings are darker.

July; on grassy banks; Southgate.

Sp. 4. Isos. crassicorne. Fem. *Nigrum, præcedenti brevius, prothorace anticè maculis duabus flavis, antennis rufo-cinctis, alis subfuscis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus flavis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: oviductus apice flavus: antennarum articulus primus apice, tertiusque basi, rufo-fusci: tibiæ nigro-fuscæ: genua tarsique rufi: alæ subfuscæ. (Alarum longitudo, $1\frac{2}{3}$—2 lin.)

The body of this species is rather shorter than that of Isos. fumipenne, which it much resembles in shape: the antennæ are thicker in proportion, and more clavate: the abdomen is smooth, shining, very finely punctured, slightly pilose toward the apex: excepting the red colour of the extremities of the first, and the whole of the ringshaped third and fourth joints, the antennæ are black: the wings are slightly fuscous, the nervures darker.

June; amongst grass in fields; Southgate.

Sp. 5. Isos. simile. Mas. *Nigrum, præcedentibus angustius, prothorace anticè maculis duabus obscurè flavis, alis fuscis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus obscurè flavis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennæ basi flavæ: tibiæ nigro-fuscæ, anticæ apice flavæ: tarsi fusci: genua flava: alæ fuscescentes. (Alarum longitudo, $1\frac{3}{4}$ lin.)

It is nearly allied to Isos. longulum, but is much smaller, and appears later in the year: the body is more slender: the wings narrower and darker.

July; amongst grass in fields; Southgate.

Sp. 6. Isos. angustipenne. Mas. *Nigrum, prothorace anticè maculis duabus pallidè flavis, alis fuscis angustis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus pallidè flavis: abdomen nitidum, glabrum: antennæ basi tarsique fusci: genua flava: alæ fuscæ. (Alarum longitudo, $1\frac{1}{3}$ lin.)

The wings of this species are very narrow, their breadth not being more than one-fourth of their length; this character, and its fuscous wings, will distinguish it from most species of Isosoma.

May; amongst grass in moist situations; Southgate.

Sp. 7. Isos. brevicorne. Mas. *Nigrum, prothorace anticè maculis duabus albidis, antennis dimidio corporis vix longioribus, alis fuscis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennæ quam in præcedentibus breviores: tibiæ anticæ fuscæ, subtus flavæ: tarsi flavi, articulis 4 et 5 fuscis: genua flava: alæ fuscæ. (Alarum longitudo, $1\frac{1}{2}$ lin.)

This species is more minutely punctured than any of the preceding: the sides of the proscutellum have each an obscure white spot on their anterior margins: the antennæ are very short, scarcely more than half the length of the body: the three basal joints of the tarsi are yellow, the fourth and fifth fuscous: it resembles Isos. crassicorne, of which, possibly, it may be the male, but it is much narrower, the antennæ are

scarcely longer, and the head is much smaller: in Isos. longulum the male and female have very much the same shape, and the former has the larger head.

July; amongst grass in fields; Southgate.

Sp. 8. Isos. hyalipenne. Fem. *Nigrum, prothorace anticè maculis duabus pallidè flavescentibus, antennis basi flavis, alis hyalinis.*

Caput obscurum: oculi rufo-fusci: thorax punctatus, maculis anticè duabus lateralibus pallidè flavis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: oviductus apice pallidus: antennæ articulo primo apice, tertioque basi, flavis: tibiæ anticæ fuscæ: femorum tibiarumque apices, genua tarsique flavi: alæ hyalinæ, nervis fulvis. (Alarum longitudo, 3 lin.)

The abdomen is slightly pilose toward the apex: the antennæ have the apex of the first, and the whole of the ring-shaped third and fourth joints, yellow: the anterior tibiæ are fuscous: the tips of the thighs and tibiæ are yellow: the four posterior tarsi have the basal joint yellow, the following yellow beneath, with a fuscous line above gradually darker toward the apex: the anterior tarsi are yellow, with the basal and apical joints fuscous: the wings are hyaline, the nervures fulvous: the subcostal nervures of the superior wings are fuscous toward the base.

July; amongst grass in fields; Southgate.

Sp. 9. Isos. longicorne. Mas. *Nigrum, prothorace anticè maculis duabus albidis, antennis corpori longitudine æquis, alis fuscis.*

Caput obscurum: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: tibiæ anticæ fuscæ: femorum tibiarumque apices, genua tarsique flavi: alæ fuscæ. (Alarum longitudo, $1\frac{2}{3}$ lin.)

The body is rather long and narrow: the anterior margin of the proscutellum has an obscure white spot on each side: the abdomen is slightly pilose toward the apex: the antennæ, in length, exceed those of any other species in this genus: the tips of the thighs and tibiæ are yellow: the anterior tibiæ are fuscous: the basal joints of the tarsi are yellow, the apical fuscous: the wings are fuscous.

July; amongst grass in fields; Southgate.

Sp. 10. Isos. breve. Mas. *Nigrum, prothorace anticè maculis duabus pallidè flavescentibus, alis subfuscis.*

Caput obscurum: oculi rufo-fusci: ocelli rufi: thorax punctatus, maculis anticè duabus lateralibus pallidè flavis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: femora apice, tibiæ basi apiceque flavæ: tibiæ anticæ fuscæ: tarsi flavi: alæ subfuscæ. (Alarum longitudo, $1\frac{1}{3}$—$1\frac{1}{2}$ lin.)

The body, antennæ, and wings, are shorter in this species than in Isos. longicorne; the latter, too, are paler: the tips of the thighs and tibiæ, and the base of the latter, are yellow, as also are the tarsi, except the two terminal joints, which are fuscous, as likewise the anterior tibiæ: the wings are slightly fuscous.

July; amongst grass in fields; Southgate. September; Isle of Wight.

Sp. 11. Isos. minor. Mas. *Nigrum, prothorace anticè maculis duabus albidis, alis subhyalinis.*

Caput obscurum: oculi rufo-fusci: ocelli rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: tibiæ anticæ fuscæ: genua flava: tarsi fusci, basi pallidiores: alæ subhyalinæ. (Alarum longitudo, $1\frac{1}{4}$—$1\frac{1}{3}$ lin.)

It is smaller than the preceding species, which it much resembles: the antennæ are shorter and more slender: the wings also are shorter and narrower: in some specimens, probably lately hatched, the eyes and ocelli are paler: the wings are nearly hyaline.

July; amongst grass in fields; Southgate. September; Isle of Wight. End of May; Southampton.

Sp. 12. Isos. elongatum. Mas. *Nigrum, præcedenti angustius, prothorace anticè maculis duabus albidis, alis subhyalinis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: femora tibiæque apice, tibiæ tarsique basi flavi: tibiæ anticæ tarsique fusci: alæ subhyalinæ. (Alarum longitudo, $1\frac{1}{4}$—$1\frac{1}{3}$ lin.)

It is longer and more slender than either of the two preceding species: from the latter it may also be distinguished

by its narrower wings: the antennæ are much shorter, the wings shorter and narrower than those of Isos. longicorne.

July; amongst grass in fields; Southgate.

Sp. 13. Isos. petiolata. Mas. *Nigrum, prothorace anticè maculis duabus albidis, petiolo elongato, alis subfuscis.*

Caput obscurum: oculi rufo-fusci: ocelli rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus, abdominis dimidio longior: abdomen nitidum, glabrum: tarsi fusci: tibiæ anticæ apice genuaque flavæ: alæ subfuscæ. (Alarum longitudo, $1\frac{3}{4}$ lin.)

The petiole in this species is much longer than in any of the preceding, its length being more than half that of the abdomen: the body is nearly double the length of the antennæ: the wings are slightly fuscous, the nervures darker.

July; amongst grass in fields; Southgate.

Sp. 14. Isos. cornutum. Mas. *Nigrum, prothorace anticè maculis duabus pallidè flavescentibus, alis hyalinis.*

Caput obscurum: oculi rufo-fusci: ocelli rufi: thorax punctatus, maculis anticè duabus lateralibus pallidè flavis: petiolus obscurus, punctatus, abdominis dimidio longior: abdomen nitidum, glabrum: tibiæ apice, genua tarsique flavi: coxæ tarsique apice fusci: tibiæ anticæ fuscæ, subtus flavæ: alæ hyalinæ, nervis pallidè fuscis. (Alarum longitudo, $1\frac{1}{2}$ lin.)

This species resembles the preceding in shape: it is smaller: the wings are hyaline, the nervures pale yellowish fuscous, and the stigmal branch forms a more acute angle with the superior margin of the wing.

September; Isle of Wight.

Sp. 15. Isos. tenuicorne. Mas. *Nigrum, prothorace anticè maculis duabus albidis, antennis gracilibus, alis subhyalinis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: tibiæ anticæ nigro-fuscæ: genua flava: tarsi fusci: alæ subhyalinæ, nervis pallidè fuscis. (Alarum longitudo, 1 lin.)

It has much resemblance in form to Isos. elongatum: it is narrower in proportion, and smaller: the antennæ and wings are more slender.

May; grass in fields; Southgate.

Sp. 16. Isos. pusillum. Mas. *Nigrum, prothorace anticè maculis duabus albidis, alis subfuscis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum; tibiæ nigro-fuscæ: tarsi fusci: genua flava: alæ subfuscæ. (Alarum longitudo, $\frac{3}{4}$ lin.)

Like the preceding, but shorter, and the antennæ are thicker.

End of May; amongst grass in fields; Southampton.

Sp. 17. Isos. breviventre. Mas et fem. *Nigrum, prothorace anticè maculis duabus albidis, alis hyalinis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum, breve: genua tarsique flavi: alæ hyalinæ, nervis pallidè fuscis. (Alarum longitudo, $\frac{3}{4}$ lin.)

It is shorter than Isos. tenuicorne, or minor: from the former it differs also by its thick antennæ, their greater length distinguishes it from Isos. pusillum.

End of May; amongst grass in fields; Southampton.

Sp. 18. Isos. angustatum. Fem. *Nigrum, prothorace anticè maculis duabus albidis, alis pallidè flavofuscis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: femora et tibiæ apice flavæ: tarsi flavi, articulis 4 et 5, nigro-fuscis: alæ pallidè flavofuscæ, nervis concoloribus. (Alarum longitudo, $1\frac{1}{4}$—$1\frac{2}{3}$ lin.)

It is more linear than any of the preceding species, and the colour of the first, second, and third tarsal joints is brighter, the fourth and fifth joints are dark fuscous: the wings are very slightly tinged with yellow, the nervures are pale: it much resembles the female of the preceding species, but is larger, and has thicker antennæ.

June, July; amongst grass in fields; Southgate. September; Isle of Wight.

Sp. 19. Isos. dissimile. Mas. *Nigrum, prothorace anticè maculis duabus albidis, tibiis anticis fuscis, alis hyalinis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, maculis anticè duabus lateralibus albidis: petiolus obscurus, punctatus:

abdomen nitidum, glabrum: tibiæ anticæ tarsique fusci: genua pallidè rufa: alæ hyalinæ, nervis pallidè fuscis. (Alarum longitudo, $1\frac{3}{4}$ lin.)

The wings in this species are more hyaline than in most of the preceding: in length, the antennæ are equal to three-fourths of the body, and exceed those of Isos. minor, breve, or elongatum.

End of May; Southampton.

††† *Prothorax fulvus.*

Sp. 20. Isos. fulvicolle. Fem. *Nigrum, prothorace pedibusque fulvis, alis pallidè flavescentibus.*

Caput obscurum: oculi rufo-fusci: ocelli rufi: thorax punctatus, anticè rufus, maculis duabus lateralibus albidis: petiolus obscurus, punctatus: abdomen nitidum, glabrum: oviductus apice fulvus: antennarum articulus primus, secundus apice, tertiusque basi, fulvi: femora intermedia basi nigro-fusca: tarsi apice fusci: alæ hyalinæ, pallidè flavescentes, nervis concoloribus. (Alarum longitudo, $1\frac{1}{2}$—$1\frac{2}{3}$ lin.)

The prothorax of this species is fulvous, the posterior margin black, the anterior with a white spot on each side: the basal joint of the antennæ, the tip of the second joint, and the ring-shaped third and fourth joints, are fulvous: the intermediate thighs have a dark fuscous spot on each, near the base: the fifth joint of the anterior, the fourth and fifth joints of the four posterior tarsi, are fuscous.

May; amongst grass beneath trees; Southgate. September; Culver Cliffs, Isle of Wight.

** *Abdomen apice acuminatum, subcompressum.*

Sp. 21. Isos. depressum. Fem. *Nigrum, prothorace anticè maculis duabus albidis, alis subfuscis.*

Caput obscurum: oculi ocellique rufi: thorax punctatus, albido utrinque anticè maculatus: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennarum articulus secundus apice, tertiusque basi, fusci: pedes flavi, femoribus basi nigris, tibiis 4 posticis medio tarsisque apice fuscis: alæ subfuscæ. (Alarum longitudo, 2—$2\frac{1}{3}$ lin.)

Var.—Femora tibiæque 4 posticæ nigræ: tibiæ anticæ medio fuscæ.

The semihyaline spots on the proscutellum are much larger

in this species than in any of the preceding: the wings are long and rather broad.

July; amongst grass in fields; Southgate.

Sp. 22. Isos. lineare. Fem. *Nigrum, prothorace anticè maculis duabus albidis, tarsis flavis, alis hyalinis.*

Caput obscurum: thorax punctatus, albido utrinque anticè maculatus: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennarum scapus fuscus: femora antica apicem versus, genua tarsique flavi: tibiæ anticæ fuscæ: alæ hyalinæ, nervis flavis. (Alarum longitudo, $1\frac{1}{2}$ lin.)

This species has more slender antennæ than Isos. angustatum, which it resembles in shape, but the body is longer and narrower: the abdomen is slightly compressed: the white spot on each side of the proscutellum is rather large: it is more linear than Isos. depressum, and has much shorter wings.

July; amongst grass in fields; Southgate.

Sp. 23. Isos. attenuatum. Fem. *Nigrum, prothorace anticè maculis duabus albidis, tarsis anticis fuscis, alis hyalinis.*

Caput obscurum: thorax punctatus, albido utrinque anticè maculatus: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennarum scapus fuscus, basi flavus: pedes flavi, femoribus tibiisque 4 posticis nigris: femora basi, tibiæ apice, tarsique antici, fusci: alæ hyalinæ, nervis pallidè flavis. (Alarum longitudo, $1\frac{1}{2}$ lin.)

It is very similar to the preceding species, but the body is longer and narrower: the white spots on the proscutellum are larger: the abdomen is more compressed: the antennæ are shorter, and more clavate: and the wings are much narrower.

July; amongst grass in fields; Southgate.

Genus II. Systole[c], *Walker.*

Fem. Caput magnum: antennæ 12-articulatæ, breves, submoniliformes, clavatæ apice acuminatæ: thorax convexus: abdomen breve, cylindricum.

Sp. 1. Syst. albipennis. Fem. *nigra, alis albis.*

Oculi ocellique rufi: antennæ apice nigro-fuscæ: caput, thorax, et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiæ

[c] συστολη, *contractio.*

anticæ, genua, tarsique fusci, subtus flavi: alæ albæ, nervis pallidè fuscis. (Alarum longitudo, 1 lin.)

September; Isle of Wight.

Genus III. Eurytoma, *Illiger.*

Caput magnum: palpi maxillares 4-articulati: *maris* antennæ 11-articulatæ, setaceæ, verticillato-pilosæ, articulo primo elongato, secundo breviore, tertio et quarto brevissimis, quinto et sequentibus remotis, latitudine decrescentibus: *feminæ* antennæ 12-articulatæ, pilosæ, submoniliformes, clavatæ: thorax gibbosus: abdomen compressum.

Sp. 1. Eur. verticillata. Mas et fem. *Nigra, pilosa, alis subhyalinis.*

Diplolepis verticillata. *Fab.*

Caput obscurum: oculi ocellique nigro-fusci: thorax punctatus, gibbosus: petiolus obscurus, punctatus: abdomen nitidum, glabrum: antennæ maris fusco-pilosæ: tarsi fusci: genua flava: alæ latæ, subhyalinæ, nervis fuscis. (Alarum longitudo, $2\frac{1}{2}$—3 lin.)

June; amongst grass in meadows; Southgate. July; south of France.

Sp. 2. Eur. longipennis. Mas. *Nigra, pilosa, præcedenti angustior, alis longioribus subhyalinis.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: genua flava: tibiæ anticæ tarsique fusci, subtus flavi. (Alarum longitudo, $2\frac{2}{3}$ lin.)

The smaller head, the much narrower, and less gibbous thorax, the longer antennæ and wings, the latter also narrower, distinguish this species from the preceding.

July; amongst grass in meadows; Southgate.

Sp. 3. Eur. Abrotani *Panzer.* Mas et fem. *Nigra, alis hyalinis.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiæ anticæ fuscæ, subtus flavæ: tarsi antici genuaque flavi: tarsi 4 postici pallidè straminei, supra pallidè fusci: feminæ tarsi omnino flavi. (Alarum longitudo, $1\frac{3}{4}$—$2\frac{1}{3}$ lin.)

Var.—Femora basi, tibiæque anticæ, flavæ.

In shape, this species very much resembles Eur. verticillata, but it is more slender, and the antennæ are rather longer in proportion.

June; amongst rushes in meadows; Southgate. September; Isle of Wight.

Sp. 4. Eur. apicalis. Mas et fem. *Nigra, præcedenti angustior, alis hyalinis.*

Caput obscurum: antennæ graciles: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiæ anticæ fuscæ, subtus flavæ: genua tarsique flavi. (Alarum longitudo, $1\frac{1}{2}$—$2\frac{1}{4}$ lin.)

Var.—Femora basi tibiæque anticæ flavæ.

In this species the head is smaller, the body longer and narrower than in the preceding.

July; amongst grass, in meadows; Southgate. September; Isle of Wight.

Sp. 5. Eur. curta. Mas et fem. *Nigra, Eur. abrotani simillima, brevior, alis latioribus.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiæ anticæ fuscæ, subtus flavæ: genua tarsique flavi: alæ hyalinæ. (Alarum longitudo, $1\frac{3}{4}$—2 lin.)

The anterior tarsi are fuscous above: the four posterior tarsi are entirely yellow, or have a pale fuscous longitudinal line above, darker toward the apex.

July; in meadows; Southgate. September; Islė of Wight. July; in the Forest of Fontainebleau.

Sp. 6. Eur. collaris. Fem. *Nigra, tarsis flavis, præcedenti simillima, statura graciliore antennisque longioribus differt, necnon, alis subfuscis elongatis angustis.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: tibiæ anticæ fuscæ, subtus flavæ: genua tarsique flavi. (Alarum longitudo, $2\frac{1}{2}$ lin.)

This species has a longer and narrower body than most of the preceding: a considerable resemblance exists between it and Eur. longipennis, but the wings of the former are much narrower, the alary nervures and the tarsi paler.

July; amongst grass, in fields; Southgate.

Sp. 7. Eur. nitida. Mas. *Nigra, Eur. apicali affinis, alis hyalinis angustioribus.*

Caput obscurum: oculi nigro-fusci: ocelli rufi: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: genua tarsique flavi. (Alarum longitudo, $1\frac{1}{2}$ lin.)

It is nearly related to Eur. apicalis, but has much longer and more slender antennæ: the wings also are narrower.

July; amongst grass in fields; Southgate.

Sp. 8. Eur. gracilis. Mas et fem. *Nigra, præcedenti longior, alis hyalinis.*

Caput obscurum: oculi ocellique rufi: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: pedes flavi: *maris* femora tibiæque 4 posticæ fusco-cingulatæ, *feminæ* nigro-fuscæ: tibiæ anticæ *feminæ* supra fuscæ. (Alarum longitudo, $1\frac{1}{2}$—$1\frac{2}{3}$ lin.)

It is longer and more slender, and has narrower wings than Eur. apicalis: the female may be distinguished from Eur. collaris by its more linear form, more clavate antennæ, shorter and narrower wings, &c.

July; amongst grass, in fields; Southgate. End of May; Southampton.

Sp. 9. Eur. annulipes. Mas. *Nigra, tibiis fusco cingulatis, alis subfuscis.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: pedes flavi: femora basi nigra: tibiæ nigro-fusco cingulatæ. (Alarum longitudo, 1—$1\frac{2}{3}$ lin.)

Var.—Tibiæ anticæ fuscæ.

Like Eur. gracilis; but the antennæ are shorter, the wings broader, and the alary nervures paler.

September; Isle of Wight. July; Forest of Fontainebleau.

Sp. 10. Eur. minuta. Mas. *Nigra, alis hyalinis albis.*

Caput obscurum: oculi ocellique rufo-fusci: genua tarsique flavi: tibiæ anticæ fuscæ. (Alarum longitudo, $\frac{2}{3}$ lin.)

I discovered this very minute species in the Forest of Fontainebleau, during the month of July.

Sp. 11. Eur. rufipes. Mas et fem. *Nigra, pedibus rufis, alis hyalinis.*

Caput obscurum: oculi ocellique rufo-fusci: thorax et petiolus obscuri, punctati: abdomen nitidum, glabrum: pedes pallidè

rufi: *maris* femora postica nigro-fusco cingulata, antica basi fusca. (Alarum longitudo, 2 lin.)

Body broad, gibbous: head large: wings rather short.
July; on windows; Southgate.

Genus IV. Decatoma, *Spinola.*

Caput medium: palpi maxillares 3-articulati: *maris* antennæ 11-articulatæ, pilosæ, subclavatæ: *feminæ* antennæ 12-articulatæ, pilosæ, clavatæ: thorax gibboso-cylindricus: abdomen compressum.

* *Stigma sublunaris.*

Sp. 1. Dec. Cooperi. *Curtis.* Mas et fem. *Nigra, pubescens, flavo variegata.*—British Entomology, Plate 345.

Caput punctatum, anticè flavum: oculi ocellique rufi: thorax punctatus, obscurus, anticè flavo marginatus: abdomen nitidum, glabrum: antennæ basi apiceque flavæ: pedes flavi: tibiæ posticæ femoraque 4 posticæ nigro maculatæ: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo, $2\frac{3}{4}$ lin.)

Found on the hazel-tree, in September, by A. Cooper, Esq.

Sp. 2. Dec. biguttata. Mas et fem. *Nigra, abdomine bimaculato, flavo variegata.*

Chalcis biguttata. *Swed.*

Maris oculi ocellique rufi: prothorax utrinque flavo maculatus: abdomen basi fuscum: antennæ fuscæ, scapo obscuriore: femora basi, genua tarsique flavi: tibiæ anticæ fuscæ, subtus flavæ: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra: *feminæ* caput flavo variegatum: prothorax flavus, maculis 3 nigris: mesothoracis lineæ duæ, obliquæ: alæ basi, abdomen basi, maculæque duæ laterales sublunatæ, flavæ: antennarum articulus 2 apice clavaque flavi: pedes flavi: femora tibiæque nigro vel fusco maculatæ. (Alarum longitudo, $1\frac{3}{4}$—2 lin.)

A yellow line extends along the suture, between the scutum and the parapsides of the mesothorax: there is a yellow line also between the mesoscutellum and the metathorax.

June; amongst grass beneath oak trees; Southgate.

Sp. 3. Dec. obscura. Fem. *Nigra, flavo variegata, femora tibiæque anticæ fusco maculatæ.*

Oculi ocellique rufi: caput anticè flavo variegatum: prothorax utrinque flavo maculatus: antennæ fuscæ, apice subtusque pallidiores: femora basi, genua tarsique flavi: pedes antici flavi, femoribus tibiisque fusco maculatis: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo, $1\frac{2}{3}$ lin.)

The principal difference between this species and Dec. biguttata, is the prothorax with only two yellow lateral spots, and the entirely black abdomen of the former.

June; amongst grass beneath trees; Southgate. July; South of France.

Sp. 4. Dec. immaculata. Mas. *Nigra, capite thoraceque immaculatis.*

Oculi ocellique rufi: abdomen basi rufum: antennæ fuscæ, apice pallidiores: femora basi, genua tarsique flavi: pedes antici flavi, femoribus tibiisque fusco maculatis: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo, $1\frac{2}{3}$ lin.)

July; amongst grass beneath trees; Southgate.

Sp. 5. Dec. plana. Fem. *Nigra, flavo variegata, mesothorace immaculato, abdomine bimaculato.*

Oculi ocellique rufi: caput et prothorax flavo variegati: abdomen maculis duabus lateralibus rotundatis parvis flavis: antennæ fuscæ, apice pallidiores: pedes flavi: femora tibiæque 4 posticæ nigro, anticæ fusco maculatæ: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo, $1\frac{2}{3}$ lin.)

This species is nearly allied to Dec. biguttata: it is smaller, more slender, and less variegated with yellow: the mesothorax is entirely black.

July; amongst grass beneath trees; Southgate.

Sp. 6. Dec. mellea. Fem. *Flava, nigro variegata.*

Oculi ocellique rufi: caput posticè, post-scutellum anticè, mesothoracis linea transversa, metathorax, abdominis maculæ 3 connectæ dorsales petiolusque nigri; antennarum articulus 2 supra fuscus: alæ hyalinæ: stigma sublunaris, fusca, costam versus nigra. (Alarum longitudo, $1\frac{2}{3}$—$1\frac{3}{4}$ lin.)

Var.—Antennæ fuscæ: tibiæ 4 posticæ fusco maculatæ.

May; amongst grass beneath trees; Southgate. September; Isle of Wight.

** *Stigma subtrigona.*

Sp. 7. Dec. variegata. Mas et fem. *Nigra, flavo variegata.*

Maris oculi flavo cincti ocellique rufi: proscutellum flavo quadrimaculatum; abdomen basi rufum: antennæ fuscæ, apice pallidiores: pedes flavi: femora nigro, tibiæ fusco maculatæ: alæ hyalinæ: stigma subtrigona, fusca, costam versus nigra: *feminæ* caput flavum, nigro variegatum: prothorax flavus, nigro trimaculatus: mesothoracis scutum scutellumque flava, lateraliter maculata: abdomen maculis duabus lateralibus sublunatis flavis: antennarum articuli 1 et 2 nigro-fusci, apice subtusque flavi. (Alarum longitudo, 1—1$\frac{3}{4}$ lin.)

Var. β.—*Fem.* mesoscutum flavo obliquè bilineatum.

Var. γ.—*Fem.* mesoscutellum nigrum, immaculatum.

The proscutellum of the male has four yellow spots, the two interior ones much the largest: that of the female is yellow, with a black spot on each side, and a larger one in the centre: the mesoscutellum has a yellow margin, interrupted toward the base.

July; amongst grass beneath trees; Southgate.

Sp. 8. Dec. minuta. Mas. *Nigra, flavo variegata, abdomine nigro-fusco, antennis basi flavis.*

Caput flavum, posticè nigrum: proscutellum bilineatum, lateribusque flavis: abdomen nigro-fuscum, basi pallidum: petiolus niger: antennæ fuscæ, basi apiceque flavæ: pedes flavi: femora tibiæque fusco maculatæ: alæ hyalinæ: stigma subtrigona, nigra aut nigro-fusca. (Alarum longitudo, 1 lin.)

May; amongst grass beneath trees; Southgate.

Sp. 9. Dec. unicolor. Mas. *Nigra, immaculata, aut flavo bimaculata.*

Oculi ocellique rufi: abdomen basi obscurè rufum: antennæ nigro-fuscæ, apice subtusque pallidiores: scapus niger: genua tarsique flavi: tibiæ anticæ fuscæ: alæ hyalinæ: stigma subtrigona, nigra. (Alarum longitudo, 1$\frac{1}{4}$ lin.)

Var.—Proscutellum utrinque flavo maculatum.

June; amongst grass beneath trees; Southgate.

Sp. 10. Dec. tenuicornis. Mas. *Nigra, flavo bimaculata, antennis flavis.*

Proscutellum utrinque flavo obscurè maculatum: abdomen basi rufum: antennæ flavæ, basi fuscæ: pedes flavi: femora tibiæque

fusco maculatæ : alæ hyalinæ : stigma subtrigona, nigra. (Alarum longitudo, $\frac{3}{4}$ lin.)

This species may be distinguished from the three preceding, by its narrower wings, and more slender antennæ.

June ; amongst grass beneath trees ; Southgate.—*(To be continued.)*

ART. III. *British Periodical Works on Entomology.*

1. *British Entomology.* By JOHN CURTIS, F.L.S.
2. *Illustrations of British Entomology.* By I. F. STEPHENS, F.L.S.
3. *Samouelle's Entomological Cabinet.*

MR. CURTIS commenced his beautiful work on the first of January, 1824, and has, with the most rigid punctuality, continued it in monthly numbers from that time to the present. We cannot be expected minutely to criticise such a mass of matter as must be contained in so extensive and laboured a production, yet we trust a few general observations will not be unacceptable to our readers.

Each number contains four highly-finished and accurately-coloured figures of insects, with dissections of the parts from which the generic characters are taken, at the foot of the page. Each of these figures is intended to illustrate a genus; and in order to be able to give plates of the most rare and beautiful species of each genus, and to record fresh discoveries as they occur, Mr. Curtis has not followed the usual plan of adopting any system of arrangement; a plan by which an author is frequently bound to publish sections of his subject, which have never obtained sufficient attention to bring them into any thing approaching a state of perfection. There are, perhaps, disadvantages attending this plan while in progress ; but ultimately the work must, by this mode of publication, be rendered much more complete than it possibly could have been, had the genera been figured in regular succession. The plates, generally, represent one Coleopterous, one Hymenopterous, one Lepidopterous, and one Dipterous or Hemipterous insect; and we may safely say, we have never seen representations more elegant, or more true to nature. The dissections we have, in many instances, examined and compared with the

originals; and we are enabled to bear our testimony to their accuracy; and are convinced that engravings of this kind, tend more to fix the characters of genera on the mind than the most laboured descriptions.

Mr. Curtis frequently, in his plates of Lepidoptera, gives a figure of the larva, together with the plant on which it feeds: and, unwilling as we are to find fault, we feel we shall not be doing our duty to the public without expressing our disapprobation of a practice which Mr. Curtis has latterly too frequently adopted; we mean, that of copying the larvæ from the figures of Continental authors, instead of from real British specimens. Mr. Curtis must be thoroughly aware, that the same species varies so much in different climates, as to size, colour, and form, that it would be quite incorrect to figure an exotic specimen as British, even of an insect decidedly ascertained to be a native: secondly, every one is aware of the great propensity in our Continental neighbours to exaggerate their drawings, both as to size and colour: and, thirdly, Hubner's acknowledged carelessness about names, must frequently be a cause of error; and this error thus becomes perpetuated. We feel confident Mr. Curtis's excellent sense will convince him of the validity of these objections, especially when we assure him that many of his subscribers would prefer having no figure of the larva at all, to one copied from a foreign author. The gaudy caterpillars already figured, give to this part of the work a semi-foreign appearance, which deteriorates its value in the eyes of the British Entomologist: we speak not unadvisedly; we make ourselves the organ of the sentiments of others.

In future numbers of this magazine, we purpose examining minutely every number of Mr. Curtis's, and all other periodicals which may intervene between the appearance of our own numbers; but it is obvious we cannot suitably infringe on our allotted space for that purpose now, as it is necessary to give a general idea of each work before commencing the more laborious detail. We conclude, by heartily recommending the work before us to the attention and patronage of *every* British Entomologist; and we already have the happiness of knowing that, on the Continent of Europe, it is held in the highest esteem.

Mr. Stephens's highly valuable work, entitled "*Illustrations of British Entomology*," was commenced 1st January, 1829, and

has been continued, in monthly numbers, to the present time. In its appearance, however, we are sorry to say, there has been much irregularity, both as to time of publishing and quantity of matter; an irregularity which, having been severely commented on elsewhere, we only notice, for the sake of expressing our sincere desire that it may never occur again; as, in that case, the painful task of reprehension must fall on us, in the regular discharge of our duty to the public. Having mentioned the subject, we must express our regret that the article in question should have been written in the spirit in which it was; for, although we firmly believe the writer was unbiassed by any other motive than a wish to serve the public, yet it is clear that so pointed an attack must be productive, in many breasts, of an unkind feeling, which it should be the object of every scientific man to allay rather than excite. When we consider the very poor encouragement from the public that scientific works generally meet with in this country, it behoves us to make every possible allowance for one who has devoted the whole of his leisure time, and has doubtless sacrificed a considerable annual expenditure, to a work which affords no reasonable anticipation of even ultimate remuneration to its author. We wish, and have long wished, that a kindly and brotherly spirit were more cherished among us than has been the case of late; for we feel certain that mutual co-operation would tend materially to the advancement of the science. Let us all endeavour to forgive the past; and let us resolve not to be the first to offend in future.

To return to the work before us: the attempt to describe all the British species of insects, is in itself so bold a one, that every possible encouragement should be given to an author who would venture to undertake it. Mr. Stephens has already described above three thousand Mandibulata, and upwards of one thousand Haustellata; of a large number of which he has given plates. The specific descriptions are frequently not of that clear decided kind which we could wish; and, we think, bear the marks of too great haste in composition. We conceive it is scarcely a correct mode to make specific distinction depend in one instance on colour, and in the next on form; yet we find this mode of description frequently adopted: thus the leading words of the specific descriptions in the page open before us are: Sp. 4. *Elongatus;* 5. *Obscurè piceo-fuscus;*

6. *Levissimè punctulatus;* 7. *Piceo-niger;* 8. *Leviter pubescens.* All these characters might suit one insect, excepting that, in 5 and 7, a little tautology occurs. We are perfectly aware that Mr. Stephens is not the only author who is to be charged with this carelessness; and we would wish, in giving our advice to him, to extend it to all, that *the leading character should be descriptive of difference*, excepting when that character runs through several species: in such instances, it may be repeated before each: and the second character must then be looked to as the distinguishing one.

This work, like Mr. Curtis's, we consider absolutely essential to the study of British entomology; and we strongly recommend those who are not yet on the list of Mr. Stephens's subscribers to enroll their names; and thus contribute their mite towards the support of a work calculated to be so eminently useful.

In concluding our notice of this highly valuable work, we must extend to British entomologists a caution;—BEWARE OF PIRACIES! The scissors-and-paste system of book-making seems now to have reached its acmé. A cheap pirated edition of Mr. Stephens's Illustrations of Haustellata has just appeared. It is got up by a quack so totally ignorant of the subject on which he *professes* to write, as to have faithfully retained every error, even those which have been merely typographical, and subsequently corrected by Mr. Stephens himself. Entomologists ought to unite in setting their faces against such an infamous proceeding: had they done so in a prior instance, this caution had not been needed. We are aware of the rage for cheap books; but we beg our readers to recollect the reason assigned by the broom-seller for being able to dispose of his brooms at such a low price,—he stole them ready-made.

MR. SAMOUELLE'S pretty little work was commenced on the 1st of January, 1832, and, like the preceding ones, appears in monthly numbers, each containing six figures of British insects. It seems well calculated to please and instruct children in the history of insects; but we would caution Mr. Samouelle, if he expects his "Cabinet" to circulate among grown-up entomologists, to pay a little more attention to the letter-press as well as the pictorial part. Of such insects as *Carabus*,

Trox, &c., we could not have even guessed the genera: and in the description, we have "punctured with elevated lines," and similar inconsistencies continually. Names are also frequently incorrect: *Callidium bajulum* was a typographical error in Mr. Stephens's Catalogue, since corrected in his Illustrations. A *Nomada*, figured some time back, Mr. Samouelle will see by referring to the *Monographia Apum*, is incorrectly named. In the same number we observe the author adopts the old mistake of Fabricius about *Ægeria Asiliformis*, though so recently satisfactorily cleared up by Mr. Newman.

In every case in which an author endeavours to combine popularity and extensive sale, with science, an unusual degree of accuracy is required; as, in these instances, the blunders are calculated to do so much more harm from their wider dissemination. We hope Mr. Samouelle will profit by our admonition, and give us no reason to make similar complaints in our January number. We wish him success; but we should recommend him to take the necessary means to ensure it.

Art. IV.—*Some Observations on Blight.* By Rusticus.

Sir,—It strikes me, that if you make the Entomological Magazine merely a medium for monographs, and that description of writing, your readers will weary of your unceasing technicalities, and lose their appetite before the quarterly meal you propose providing for them is consumed. There are many, who, like myself, are well enough pleased with a little taste of the science, without wishing to dip too deeply into it; and I beg of you to consider whether an occasional paper, containing no *crack-jaw*, would not be an inducement to some of these to take up your Mag. With this view, I shall send you a few observations on blights of various kinds, giving you full permission to translate any phrases which are too plain for the comprehension of the *élite*, into your choicest *cat-Latin;* but recollect, Sir, such editorial translations must be confined to foot-notes with Ed. attached:—I would not, for all the world, have the sin of your barbarisms to answer for.

Blight is a term generally misunderstood; especially among those whom it more particularly concerns. The knowing

horticulturist will tell you, "There is blight in the air to-day:" and in a few days or weeks, he will see the web of the *lackey*, or the *yellow tail*, or the *ermine*, on his white-thorn hedge-rows; or the caterpillars of the *death's-head hawk moth* on his potatoes; or those of butterflies on his cabbages; and then he will give you a toss of his wise head, and utter, with a gravity quite in keeping, "I knew there would be a *blight* this year; I saw it coming in the air." Perhaps, however, he may find a good many snails eating his wall-fruit; or may, perchance, tread on two or three great stag beetles while performing their evening perambulation along his gravelled walks; and then, he "knew it would be either a *blight* or a *sneg;* but it's more of a *sneg* this year." Further than this, the horticulturist has not progressed: webs and soft insects are *blights;* snails and hard insects are *snegs*. Warm south-east winds produce the first; cold north-east winds, the last; and yet the same man would laugh in your face if you were to say seriously, on a cold misty morning, "There will be a *rise* in the funds to-morrow, I can see it in the air." I maintain that there can hardly be a greater service performed to horti- and agri-culturists, than by pointing out to them the nature and habits of their insect enemies; and their laughing at us in the first instance will perhaps be repaid by their thanking us at last.

Let us consider, separately, some of the insects which bear the name of blight. We will, in the first instance, examine the apple-tree. Cider is an important article of manufacture, as well as consumption, in many of our counties; and, consequently, whatever tends to increase or diminish the supply, ought to be deemed by the grower worth his notice. The apple-tree has many assailants: the principal are the weevil,[a] (*weevillum pomi?*), the woolly louse or American blight, and the moth. I will describe the first of these, and its mode of proceeding.

By carefully examining the bark of an apple-tree in the winter, you will occasionally find a pretty little beetle in the cracks, which, directly on being touched, shams dead, and drops on the ground, where you will not, without great difficulty, discover it, on account of the great similarity of its colour; you must, therefore, hunt till you find another. This

[a] Anthonomus pomorum.—Ed.

time, as soon as you see him, place one hand below him, then touch him lightly with a little bit of stick, and he will drop into your open hand; his own scheme for self-preservation will beat him. Now roll him into a quill, or pill-box, and take him home. Place him on a sheet of writing paper; you will soon see his shape—the head is furnished with a trunk, from which, on each side, springs a feeler, bent at right-angles forward, so that the trunk altogether looks to be three-pronged, like a trident. The thorax and wing cases are brown, beautifully mottled; and an oblique line on each, pointing towards the suture or meeting of the wing-cases, is much lighter coloured, and gives the little beetle an appearance of having a letter V obscurely chalked on its back. Its size altogether is rather less than a hempseed.

With the first sunshiny day in March, these weevils leave their winter quarters, crawl up the trunk and along the twigs, perch themselves so as to receive the full benefit of the sun's rays, and plume themselves with their legs and feet all over, trident and all, just in the same manner that a cat washes her face with her paw: they then stretch out one leg at a time, cramped, no doubt, by the long confinement; they lift up their wing-cases, and unfold two large transparent wings, which, though twice as long as the wing-cases, were neatly folded up and hidden under them, and then, launching themselves into the air, they go roving about the orchards and gardens, their little hearts in an ecstacy of freedom, and love, and happiness. It is not long before each finds a suitable mate: no relations raise objections; and the nuptials are consummated. Now I will allow the gentleman weevil to go his way in quest of new loves and conquests; and in the mean time I will observe the conduct of the lady.

By the time the female is ready for the important task of depositing her eggs, the spring has considerably advanced, the apple-buds have burst, and the little bunches of blossom are readily to be distinguished. The weevil soon finds out these; and selecting a blossom every way to her mind, commences her operations. The beak, or trunk, before alluded to, is furnished at its extremity with short teeth, or mandibles: with these, she gnaws a very minute hole into the calyx of the future blossom, and continues gnawing until her trunk is plunged in up to her eyes; the trunk is then withdrawn, and

the hole examined with careful scrutiny by the introduction of one of her feelers[b], or outer prongs of her trident. If it seem to require any alteration, the trunk goes to work again, and again the feelers; at last, being fully satisfied that the work is well accomplished, she turns about, and standing with the extremity of her abdomen over the hole, thrusts into it her long ovipositor, an instrument composed of a set of tubes retractible one within the other, and deposits a single egg (never more) in the very centre of the future flower. Another examination with her feelers now takes place; and when she is thoroughly satisfied that all is right, away she flies to perform the same operation again and again, never tiring while she has an egg to lay.

The bud continues to grow like the other buds; the little perforation becomes invisible. By and bye, the egg bursts, and out comes a little white maggot, with neither legs nor wings, which, directly it is hatched, begins to devour the young and tender stamens; next to these, the style is attacked, and eaten down to the fruit, the upper part of which is quickly consumed: the maggot is then full fed; it casts its skin, becomes a chrysalis, and lays perfectly still. Up to this time the blossom has continued healthy, no trace of the enemy being to be discovered without; but when the neighbouring blossoms are expanding their petals to the genial breath of spring, those of the mutilated bud remain closed, and retain the arched balloon-like appearance of a bud about to burst. For a few days they preserve their lovely pink colour; and then, by degrees, fade to dingy brown. In this state they remain, until the other apples are well knit; and then the damaged blossoms, by their decided contrast, appear very conspicuous. On opening these brown, or rather rust-coloured blossoms, about the 10th to the 15th of June, the chrysalis will be found to have changed to a perfect beetle, similar to its parent above described, which, had it been left to itself, would, in a few days, have eaten its way through the weather-beaten case of dried petals, and left its prison-house, flying about to take its pleasure, until the chilly winds of autumn should drive it to its winter habitation under the bark: and in the next spring, the whole round of operations, through which we have watched

[b] "Ears." Rennie.—Ed.

its parent and itself, would be performed with the same unvarying unerring instinct.

The cloudy misty east wind, in which our farmers and gardeners see the *blight*, is the very weather of all least favourable to the propagation and increase of these weevils. The fine clear sunny days of March and April are the most favourable to them. The tomtits, sparrows, bullfinches, and other birds, which, at this time of year, more particularly frequent orchards and gardens, and which, also, at this time of year, are persecuted with relentless hostility by the farmer and gardener, live, during these months, solely on these weevils, and similar little insects; and, consequently, are the only check on their increase which we possess: so that, in the first investigation of blight, we see how a little prejudice, superstition, and ignorance, tend to increase the injury they dread.

I have much more of this kind in store, which shall be forwarded, if the sample be approved. If you admit all manner of *crack-jaw*, and register the invention of systems *ad libitum*, it would surely be unfair to deprive your readers of a little humble English, and plain statements of facts recorded by a faithful and attentive observer of nature.

I am, Sir, Yours, &c.
RUSTICUS.

ART. V.—*On Two Species of the Genus Elaphrus, lately discovered in Scotland by Charles Lyell, Esq.* By JOHN CURTIS, Esq. F.L.S.

SIR,—I conceive that the discovery of a new object in nature, or, in other words, the attainment of knowledge, is one of the great incitements to men engaged in science. It is therefore just to give credit to those who are, by their zeal, daily adding to our stores of knowledge by the addition of new species. With this view, it is my intention occasionally to trouble you with the characters of genera, and the description of species; and I hope when more useful contributions do not occupy the pages of your Magazine, that you will do me the favour to insert them, that I may have the pleasure of giving as well as receiving information.

It has often happened that new species of insects have been discovered, belonging to genera so circumscribed, or so well

searched for, that they were the least expected to produce novelties.

The purport of my present communication is to make known to your readers two Carabidæ that may well be included amongst unexpected discoveries; they are Elaphri, presented to me by the learned author of the Principles of Geology, to whose munificence I am so greatly indebted for many of my most valuable acquisitions. They were accompanied with the following observations:—"The Elaphri were taken, during the first fortnight in June, 1831, on the north-west side of Catlaw, a mountain in Forfarshire, on a spot nearly 2,000 feet above the level of the sea, crawling on a soft green plot of bog-moss, on a sunshiny day. The *Carabus nitens* was found at the same time and place."

The Latin characters I shall give from Dejean, as they will distinguish them from all other species; and the English descriptions from my own specimens.

ELAPHRUS, *Fab. Curtis's Brit. Ent.* fol. 179.

Sp. 1. Elaph. splendidus. *Escli.* "*Viridi-æneus, punctatissimus, thorace capite latiore, fronte thoraceque foveolatis, elytris costis subelevatis æneis nitidis interruptis, maculisque cyaneo-viridibus ocellatis quadruplici serie, tibiis tarsisque nigro-cyaneis.*"—DEJEAN'S ICONOGRAPHIE, Tom. II. p. 139, pl. 86, f. 1.

Length 4 lines. Bright green, variegated with brilliant copper: antennæ brightest at the base: head and thorax coarsely punctured, uniting into lines on the crown of the former, the latter scarcely broader than the head, with a simple Y-shaped impression on the back: elytra elongate, ovate, with twenty green foveæ on each, blueish in the centre, and forming four longitudinal lines, connected by narrow shining spaces, scarcely raised, but two towards the apex highly polished.

Sp. 2. Elaph. Lapponicus. *Gyll.* "*Oblongus, cupreo-æneus, capite thoraceque punctatissimis, subfoveolatis, elytris parcè punctulatis, maculisque cœrulescentibus ocellatis obsoletis impressis quadruplici serie.*"—DEJ. ICON. Tom. II. p. 131. pl. 86. f. 2.

Length $4\frac{1}{2}$ lines. Copper colour: antennæ chalybeous, except at the base: head and thorax punctured as in *Elaph. splendidus*, but the latter is broader, with a small deep fovea on each side the back: the sides slightly green: elytra similar to the last, but rather broader behind: the foveæ very shallow, and dull lilac.

These may be considered among the most splendid discoveries that has been lately made; for the first species is exclusively known as an inhabitant of Kamstchatka, and the other of Lapland. Only one of each was taken; and as they are male and female, I think it possible they may be the same species, although they vary in size and colour.

It may be as well to remind entomologists that there is another species, *Elaph. littoralis, Dej.*, which I have received from Austria, which so nearly resembles *Elaph. riparius*, that they may be easily confounded.

Mr. Lyell also mentions in his note, that *Callidium striatum*[a] has been taken, since my account of it was published, the end of May and beginning of June, flying in the garden; and others in or by a saw-pit, near the House of Kinnordy, in Forfarshire, Scotland.

July, 1832.

[a] Curt. Brit. Ent. Pl. 295.

ART. VI.—*Catalogue of a few Insects, found in Castle Eden Dean and its Vicinity, in the County of Durham, the beginning of July* 1831 and 1832. By GEORGE WAILES, Esq.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

Newcastle, July, 30, 1832.

SIR,—I send you a catalogue of a few insects, collected in that wild and enchanting spot, Castle Eden Dean, with some observations on their habitats, &c. hastily thrown together, which, if you deem worthy of a place in the Entomological Magazine, is much at your service. I am, Sir, yours, &c.

G. WAILES.

Before giving the list of insects, mentioned below, it may prove useful to the entomologist to premise that Castle Eden Dean is the largest and most beautiful of a series of romantic dells, or deans, which consist, as it were, of immense clefts or chasms in that part of the secondary series of rocks, termed the magnesian limestone. These deans are, for the most part, narrow and confined, and so densely covered with wood as to render them too close for the active pursuit of the entomologist;

but as the chasms approach the sea-coast, where they all terminate, the banks lose their very precipitous appearance, and expand into vallies. Small brooks, locally termed *burns*, run through them; but from the porous nature of the lime-stone, the waters seldom reach the sea: and in Castle Eden Dean, where the stream is larger, and fed by two or three small rivulets, at the distance of perhaps a mile apart, the supply poured down by one disappears, and in one place very suddenly, ere it reaches that part of the main watercourse where the next empties itself. In winter, however, the melting of the snow, and heavy rains, apparently convert the dry bed into a torrent: and, judging from the width of the channel, a large body of water must rush down the valley. Castle Eden Dean is about four miles long, and averaging nearly a quarter of a mile in width, though in some places the rocks, often a hundred feet perpendicular, reduce its breadth to half that distance. Vegetation is most luxuriant: and its botanical treasures have long rendered it famous in the works on that part of natural history. Suffice it to say the rare *Cyprepidium calceolus* is here, and almost here only to be met with. Towards the sea, the banks have a more barren appearance, and assume the peculiar marks of the tract of rocks to which the district belongs, producing a great variety of the grasses, and other plants delighting in an arid and poor soil. Here the juniper and privet are, by the force of the winds, thrown into those curious flat growths, which must have struck every one who has seen the trees and bushes growing on an exposed sea coast. The banks of the dean are generally moist, consequent on the density of the foliage, and numerous springs in the lime-stone; but here and there dry exposed grassy spots occur: and on the principal of these, nearly opposite the mansion of the proprietor, Rowland Burdon, Esq., the beautiful *Hipparchia Blandina* is to be found in abundance, being its only English habitat. I have been thus diffuse in describing the place, because I am persuaded that the connexion between entomology, geology, and botany, especially the two former, has not been sufficiently attended to; and, from my own short experience, I think a pretty good idea may be formed of the insects likely to be found in any district, if its geological features are taken into careful consideration. The following insects constitute only a part of those met with by my friend Mr. Currie

and myself; and as I give them more as an index than a full list, some will be found enumerated which are common in many parts of the kingdom besides Castle Eden.

Helobia Gyllenhalii
Leistus spinibarbis
fulvibarbis
rufescens
Calathus mollis
Abax striola
Campta lutea
Telephorus cyaneus
Orobitis cyaneus
Attelabus curculionides
Rhagium inquisitor
bifasciatum
Toxotus meridianus
Leptura melanura
lævis
ruficornis
Pachyta 8-maculata
Chrysomela litura
geminata
Hyperici
lamina
Cryptocephalus sericeus
moræi
labiatus
Lagria hirta
Acrida grisea, *Fab.*
Æshna varia
Cordulegaster annulatus
Libellula vulgata
depressa
Hipparchia Semele
Tithonus
Blandina (Aug.)
Polyommatus Alsus
Salmacis, *Steph. MSS.*
Thymele tages
Ino Statices
Anthrocera Filipendulæ
Hepialus Hectus
velleda
Hepialus carnus
Lophopteryx camelina
Dasychira fascelina
Nemeophila Plantaginis
Charæas graminis (Aug.)
Graphiphora augur
brunnea
festiva
C. nigrum
plecta
Xylophasia sublustris
Hadena plebeia
Euplexia lucipara
Miana fasciuncula
Polia herbida
Ceropacha duplaris
Leucania comma
Plusia percontationis
Phalæna margaritaria
Hipparchus cythisarius
Cleora lichenaria
Alcis repandaria
conversaria
Abraxas ulmata
Xerene albicillata
Aplocera plagiata
Thera Juniperata
Emmelesia ericetata
Blomeri, *Dale's MSS.*
Hypercallia Christiernana
Argyrositia, I. W. ella
Tipula crocata
nigra
lutescens
Dolichopeza sylvicola
Atherix Ibis
crassicornis
Zodion cinereum
Conops flavipes (Aug.)
Loxocera Ichneumonea
Micropeza lateralis

With regard to *Hipparchia Blandina*, I may observe that every variety described by Mr. Stephens is found here; and it is somewhat singular that the males never have the broad

brown band on the posterior wings instead of the blueish ash one, whilst the females may be considered as divided into two great varieties (equally common), distinguishable not only by the colour of that fascia, but by the greater distinctness of the ocelli, which in the var. η, Stephens (that with the blueish ash fascia, which, I conceive, should have been the typical variety), are rather obscure, and approach, in appearance, those of the males.

Polyommatus Salmacis.—I entirely coincide with Mr. Stephens in considering this a distinct species. I must, however, state that Mr. S.'s description in his invaluable Illustrations (Haust. Vol. III. p. 235,) is not quite correct: for I have observed, out of at least 150 specimens, that the variety with the black spot forms two-thirds of the whole; and that neither sex possesses exclusively either the white or black spot, though the majority of the former variety are males.

This butterfly appears to be confined to the sea banks; and I have never seen it above half a mile from the coast, and only stragglers at that distance.

Ino Statices is very abundant on the sea-banks: and nearly every specimen is the bright copper variety: whilst the blue-green variety is as exclusively confined to our inland habitats near Newcastle.

Hepialus carnus.—I cannot but suspect this to be only an extraordinary variety of Hep. velleda. Both occur at the same time, in the same places, and the markings seem to run into each other. This genus varies much in the colour and intensity of the markings; and I have taken specimens of Hep. Humulus with the anterior wings of a yellow tinge: and my friend Mr. Hewitson has shewn me similar specimens, captured in the Orkneys this season, which have very distinct markings on the anterior wings.

Charæas graminis.—I have generally met with a specimen or two of this moth on the wing, in the day-time, in the dean.

Xylophasia sublustris.—I took a specimen flying in the evening, in July, 1831; and Mr. Currie captured another this year. Both occurred at least three miles inland.

Alcis conversaria.—Mr. Currie was fortunate enough to meet with single specimens both years.

Thera Juniperata.—We took this very rare moth this season, in some plenty amongst the junipers. Mr. Stephens's

figure, which has evidently been drawn from a wasted example, conveys a poor idea of the beauty of fresh specimens.

Emmelesia ericitata.—The only specimen which has occurred hereabout, I met with in a damp part of the dean on our last visit.

Emmelesia Blomeri, Dale's MSS.—The first notice I had of this beautiful moth was from my friend Mr. Dale, who casually mentioned his having received a drawing of it from Captain Blomer, who bred it from the pupa in the spring of 1831. In July, I met with half-a-dozen specimens at Castle Eden, which, however, Captain Blomer did not appear to recognize, when I had the pleasure of seeing him last September; and Mr. Curtis, in November, shewed me a drawing, made from a specimen I sent Mr. Sparshall, and first intimated it was quite new. It will appear in one of his early numbers.[a] I succeeded in taking about twenty specimens this season, and suppose that the larva feeds either on the hazel, the Scotch elm, or the white thorn. The moth seems to delight in dark shady places, where the sun hardly penetrates. Can it be double brooded? Captain Blomer's was taken in the spring; mine, in beautiful condition, in July. The times of appearance of insects is comparatively little known; but the subject is well worthy of investigation.

Hypercallia Christiernana.—I took a single specimen of this little beautiful creature in 1831.

Tipula nigra.—Rare.

Dolichopeza sylvicola.—Last year, I met with this rare species near Newcastle, and also at Meldon Park; but all the specimens, about half-a-dozen, were males. This season I captured a good many, including some females. Its flight is slower than most of the Tipulidæ, and its beautiful white tarsi, as Mr. Curtis justly observes, betray it when the rest of the insect is scarcely visible. The banks of rivulets, in dark deep woods, are its favourite habitats.

[a] See Curtis's Brit. Ent. 416, for a figure of this beautiful insect, together with the rare Cyprepidium calceolus, mentioned above.—Ed.

ART. VII.—*Sphinx Vespiformis. An Essay.* By EDWARD NEWMAN. 8vo. London: Westley and Davis.

So fully convinced are all true naturalists of the importance of discovering the true system of nature, that we doubt not but this little essay will be read with pleasure, even by those who may not be disposed to coincide in the peculiar views of the author.

Like Mr. MacLeay, Mr. Newman fully believes in the existence of circular groups, though he differs from him both as to the number of minor groups, of which they are composed, and as to the manner in which they are linked together. Without entering into a comparison of his views, and those of other systematists, we will proceed at once to give an outline of the arrangement he proposes, and which he considers as more in accordance with nature than any yet before the public. After showing the identity of the Ægeria Asiliformis of modern writers with Sphinx Vespiformis of Linné, he adds:—

"To ascertain the place among insects, or even animated beings, which this Sphinx vespiformis naturally occupies, I have attempted in the following pages. The *Systema Naturæ* has, for years, been the object of my most diligent search; but the idea which I have taken of the subject is scarcely a month old. An anxiety to hear the opinions of others has urged me to scribble these few pages with, I fear, far more haste than good speed, &c. I feel, however, a firm conviction that my theory is too near an approach to truth to suffer from any garb, however slovenly, in which I may have dressed it."—Pref. p. 7.

After remarking on the probable existence of a natural system, and on the improbable nature of the supposition that the beautiful gradations, from one group to another, so conspicuous in every department of nature, should be merely the result of chance, our author proceeds:—

"Infinitely varied, however, as the course of such a peculiarity must be, the naturalist never finds those sudden departures from the regular flow of variation, which all systems, even the most approved, are constantly exhibiting; the reason of which is, *that in thus tracing approaches in his mind, he will continually discover an individual, completely surrounded by others, each of which partakes of its peculiarities, not only in a different degree, but in a different mode: and thus*

he will perceive the character, on which his attention has been fixed, ramifying in all directions. Now no system, hitherto suggested, will at all cope with this."—P. 10.

From this, after assuming the existence of circular groups, as proved, Mr. Newman proceeds to lay it down as a law of nature, that each group is composed of seven minor ones; of which the *central one* contains types of all the surrounding groups, and a seventh type peculiar to itself.

In support of a septenary division, he appeals to Scripture, (an appeal of which we cannot approve), to Cuvier, to Kirby, and lastly to Linné, remarking, moreover—

"Our own observation will speedily convince us, that most groups of animals, with which we are tolerably well acquainted, are divisible into seven. We shall never find the number greater; and, when less, we shall invariably perceive that the deficiency exists in groups, of which our knowledge is particularly limited; for the perfection of a septenary distribution of any particular group will depend entirely on our acquaintance with that group: thus the groups, at present known by the names of Mammalia, Aves, and Insecta, resolve themselves instantly into sevens."—P. 15.

We much wish that Mr. Newman had favoured us with a sketch of the distribution of the two first-named groups, of both which there has as yet been no arrangement given which comes near to nature; and we still doubt whether the present theory will at all apply to them. However, with these we have nothing to do here; so we will return to the last groups, and proceed at once to the diagram of Insecta.

In this we find Neuroptera in the centre, connected with the six other classes, as Mr. Newman calls them, as follows; to Lepidoptera, by Psyche *in Neuroptera*, and Tinea in Lepidoptera; to Diptera by Cloeon on one hand, and Chironomus on the other; Termes leads to the Hymenoptera by Formica; the approach to Coleoptera is by *insecta incognita;* to Orthoptera by Mantispa and Mantis; to Hemiptera by Psocus and Aphis. That there may be insects which will form the connecting link between Coleoptera and Neuroptera we will not deny; but, as yet, there is certainly none well known. In some of the others he seems to have mistaken a distinct analogy for an affinity; but this arises from what we consider as the greatest error of the author, an utter disbelief

in the existence of such relationships. Now, we will ask, Are there not innumerable relations of analogy between the Hymenoptera and the Diptera, and even the Lepidoptera? Are not almost all the genera of the first typified in the second; and are there not exotic species of Tenthredo L., whose transparent wings, with well-defined coloured margins and banded abdomens, might cause even an entomologist to mistake them for Sesiæ, or Egeriæ, at a short distance? And again, Do not any Hemipterous insects strongly resemble the former Lepidopterous genus?

The author, moreover, rejects, and with great semblance of reason, the division of insects into Haustellata and Mandibulata. He even places so little value on the characters dependent on the form of the mouth, as to hint that Pulex is nearly allied to Coleoptera. In this we think him decidedly wrong, considering it much nearer to the Diptera. We will now proceed to the Lepidoptera, of which he gives a diagram, first quoting the following sentence:—

"Whoever will give himself the trouble to examine thoroughly a collection of British Lepidoptera, will find a very great majority of them evincing very evident symptoms of relation to one or other of the following species:—Papilio Machaon, Sphinx Ligustri, Pyralis verticalis, Tinea pelionella, Noctua pronuba, and Geometra roboraria; and should any form, widely different from either of these, occur, it may, if the larva be known, be placed in the centre of a ring, formed by the groups, which we will suppose surrounding their respective types."—P. 33.

These six insects form the types of his six external groups; the central one he considers to have for its type Attacus Atlas.

Considering Urania allied to Geometra, by its setaceous antennæ, Mr. Newman supposes it met by Ourapteryx in that subclass, whilst Castnia and Coronis connect the Papiliones to Sphinx; both these he seems to think Papiliones. With respect to Coronis, he most probably is correct: but Castnia, setting with its wings deflexed, as we have ourselves observed, can scarcely be a butterfly; but far more resembles, even in the colouring in some species, Catocala. With regard to Urania, also, both its antennæ and palpi bear a near resemblance to those of Erebus, with which Fabricius placed some of the species, remarkable for their near resemblance in colour

to the Erebi. Moreover, one of the Arctiidæ, a native of China, has the same formed palpi as Erebus and Urania; and resembles the former in thick posterior legs. However, despite of all this, we will not say the author is wrong in assigning it the station he has.

From Sphinx he excludes the Egeriæ and Zygænæ, placing the first in the central group with Cossus, the latter in the next group with Pyralis; from which he passes by Ilithyia and Chilo to the Tineæ; thence, by Halias, to Cymatophora in the Noctuæ; and thence, by Catocala, to Metrocampus in the Geometræ. The central group is composed of *Bomby-ces*, connected with Papilio by Godart's Genus Barbicornis; *Lariæ*, by Orgyia, to Nyssia in Geometra; *Arctiæ*, by Apatela in this group, to Chareas in Noctua; *Lithosiæ*, by Lithosia, to Yponomeuta; *Notodontæ*, by Cilix, to Aglossa in Pyralis; lastly, in the centre, *Phalænæ*, including Attacus, Saturnia, &c.

For a further account of these groups, and also for a generic character of the Genus Memythrus, a genus which he has formed from Sphinx Vespiformis of Linné, we must refer our readers to the work itself, a perusal of which will amply repay them for the requisite time and attention. We will conclude by giving the following table of the "natural divisions to which Sphinx vespiformis is referable:"—

First Primary Group	Animalia.
First Kingdom	Annulosa.
Central Sub-Kingdom . . .	Insecta.
First Class	Lepidoptera.
Central Sub-Class	Phalænæ.
Second Natural Order . . .	Cossi.
Second Family	Ægeriidæ.
Second Genus	Memythrus.
First Species	Vespiformis.

ART. VIII.—*French Periodical Works on Entomology.*

1. *Iconographie et Histoire Naturelle des Coleoptères d'Europe, par* M. LE COMTE DEJEAN *et* M. BOISDUVAL. Paris.
2. *Histoire Naturelle des Lepidoptères, ou Papillons de France, par* M. GODART, *continuée par* M. DUPONCHEL, Paris.
3. *Magasin de Zoologie, par* M. GUERIN. Paris.

THE titles above given, will convince our readers that our Parisian neighbours are by no means behind ourselves in the encouragement given to periodical works on Entomology. Here are three works, all of them vying with our ablest productions, and superior, in scientific accuracy, to much which we have submitted to us by our countrymen. The plates in these works (we speak of them in a mass, and make no invidious comparison), are ever somewhat exaggerated: there seems, to us, a perpetual desire to make each representation of an insect more conspicuous—more showy—than the insect itself. This has ever been an erroneous practice: we are happy to see it is fast falling into disuse. When we compare the able works, whose titles we have given above, with the figures enlarged, and often preposterously coloured, of early continental authors, we cannot but be sensible of a great improvement in this respect. It seems to us, that the pictorial branch of natural history should strive to give a more correct idea of nature than we can possibly do by words. It should never be an object of ambition with the draughtsman "to copy Nature, and improve her too."

M. Dejean's *Iconographie* has, from the well-known talents of its authors, attained a rank in science which makes it a work of continual reference. The descriptions are generally clear and distinct; but we fancy we observe, in the plate before us, representing the genera Anchomenus and Agonum, rather too great a sameness of character. The legs, for instance, in either species, would, with but very little alteration in the shade of colour, do for all. Great attention should be paid to catch the peculiar character of each species, and fix that character in delineating it. The objection we refer to, we believe often

arises from the artists never having seen the insect while living.

The *Papillons de France*, of MM. Godart and Duponchel, has already grown to a somewhat formidable size, and, we regret to say, affords no reasonable prospect of ever arriving at a termination. M. Duponchel having proceeded as far as Pyralis, in a regular and systematic manner, now informs us that the work is to be extended, in supplementary numbers, to the Lepidoptera of Europe. This departure from the original plan of the work we most decidedly condemn: we think we are hardly going too far, in calling it a breach of faith. The subscribers of M. Duponchel must now either continue their numbers to an extent of which they can see no limit, and in which they feel but little interest, or discontinue the work altogether, and thus leave their copies imperfect. The latter course will be, and has been, adopted by so many, that we trust M. Duponchel will see the folly of departing from the original plan, and proceed, as before, with the insects to which his title alone refers—the Lepidoptera of France. With this exception, we think the work deserving support.

M. Guérin's *Magasin de Zoologie* is on the plan of Mr. Curtis's British Entomology; the genera being selected entirely at the option of the author, without any attempt at systematic arrangement. The plates and descriptions are beautiful and accurate; and we are pleased to see, in the number on our table, two contributions by our countryman, Mr. Westwood. This work we strongly recommend to the notice of entomologists. The plates and letter-press are got up with an attention that deserves encouragement; and there is a sterling worth about the publication combined with a modest appearance and unpretending style, which, we are persuaded, will render it an increasing favourite with the public.

However we may compete with our continental neighbours in this individual branch of the science, there are other and higher walks which they have made almost exclusively their own, — we mean the natural history, as regards habit and metamorphosis, and the anatomy of insects. On these subjects the works of Réaumur, Malpighi, Swammerdam, Lyonnet, Lewenhoeck, and many others, have no parallel at all on this side the channel: and, more recently, the splendid work of Straus-Durckheim, on anatomy, may be hailed as a monument

of human genius. We could not trust ourselves to undertake the task of reviewing this work in a single article; and have persuaded our talented friend Mr. Doubleday, to give, in a series of articles, a sketch of its contents. The first of these will be found in the present number, and will, we are confident, be received with pleasure by our readers, as no translation has yet appeared in England, except some garbled ones executed for an illiterate bookmaker, by some person evidently unacquainted with his subject.

Art. IX.—*An Entomological Excursion.* By Edward Doubleday and Edward Newman.

Not only the success, but the pleasure of the entomologist, are so much under the influence of the weather, that it is next to impossible to give any thing like a correct diary of a three weeks' expedition of this kind without a constant allusion to this important subject: we shall therefore offer no apology for making these notes a journal of weather as well as of entomological captures: and if the frequent repetition of the word 'rain' become at last tiresome, our reader will be kind enough to recollect how much more tiresome it must have been to those who were constantly exposed to its effects.

To begin our narrative with due formality and precision, we started outside the Worcester Mail at twenty-five minutes past seven, P.M., on the 4th of June, 1832: we occupied the roof-seat, side by side: the wind was SS.W., and a mild rain was falling, which continued until we reached Worcester, being about fourteen hours. After breakfasting at Worcester, we resumed our seat: the rain had ceased; and the sun gleamed at intervals weak and watery, on our progress. The country between Knightsford-bridge and Bromyard-down is at all times beautiful: but now, clad in the bright green of spring—for summer had not reached this country, the oak and the ash being scarcely in leaf—the richness and beauty of the scenery far exceeded the powers of an entomologist to describe. The respite from rain lasted about two hours: it then returned; and we sate silent, dripping, weary, mopish, sleepy and uncomfortable, until

we reached Leominster; and there terminated our journey for a while.

June 6th. The locality of Leominster is particularly suited to the increase of the insect tribes. It stands in a valley intersected by numerous streams, the banks of which are generally bordered by trees and underwood; and the valley itself is completely inclosed by hills, the summits of which are frequently wooded. On the morning after our arrival, we ventured out, notwithstanding the ragged and stormy appearance of the clouds, and were rewarded by the capture of several good insects; among them *Pachyta collaris* and *Atherix Ibis*, both in considerable abundance. The extremely confined habitat of the former insect is worthy of notice: we found it only on *Umbelliferæ* in the hedgerows surrounding a hop-ground; and although we could not satisfactorily ascertain that its larva feeds in the decaying poles, there appeared but little reason to doubt it. We have since learnt from Mr. Griesbach, that he has found this insect on the white-thorn blossoms in the same neighbourhood. *Chelostoma florisomne* and *Eucera longicornis* were also abundant in the hop-grounds: the former nidificates in the poles; on which we also observed a great number of *Lyctus oblongus:* the females were thrusting their long retractile ovipositors into the wood. These various tribes must, of course, cause great injury and eventual decay to the poles: we observed many were perforated in all directions. Among the growers, the hop seems to be the only object of attention; otherwise, it would not be difficult, by a slight wash over with some nauseous fluid in the winter, to secure the poles from these destroyers. The hops were looking moderately well; but on the upper leaves the Aphis was to be seen, three to ten on each leaf. The constant showers during the day prevented our going further than a few fields from the town: and the length and wetness of the grass insured us wet legs and feet; even though the sky above was for a time tolerably fair.

7th. We again kept close to the town: took more *Atherix Ibis*. This beautiful fly we obtained by sweeping with a common water-net among the weeds on the banks of the rivers. The female is much the rarer sex, occurring but as one to six of the male: the eyes of the insect, when living, are remarkably beautiful and iridescent. In the same locality we also found *Orthoperus punctum*, *Leiodes multistrigata*, and another

Leiodes, apparently undescribed, besides an immense number of the Neuropterous subclasses, *Phryganea*, *Perla*, and *Ephemera*. The weather, however, still continued so wild and wet, that we were glad to get dry shoes and stockings, and crowd to the fires which we found our friends every where enjoying.

8th. At one this morning, we mounted the Bristol and Liverpool mail, which passes through Leominster; and arrived at Shrewsbury at five, having travelled forty-two miles in about four hours. After a hasty and bad cup of coffee, we proceeded by the Express towards Oswestry, passing near or through Westfelton. We, of course, requested the coachman to point out the habitation of Mr. Dovaston, the amusing contributor to Mr. Loudon's Magazine of Natural History; but were surprised and disappointed to find that he could not do so. It is pleasant to know the residence of a naturalist, so familiar to our thoughts as this clever writer has rendered himself. The day was cloudy, but without rain. After passing the little village of Chirk, the road takes a grand sweep to the left; and, for the first time, Wales bursts on the traveller in all its beauty. However unentomological, it is quite impossible to pass by, unnoticed, those stupendous aqueducts, Chirk and Pont-y-Cyssyltau, which, bestriding valleys, seem to be the work of giants. The ride hence to Llangollen is full of beauty: the Dee, clothed with banks of trees, winds along the valley over a bed of rock; and the mountains, rising precipitously on every side, confine the horizon to about half its usual limits. At Llangollen we had a second and capital breakfast. The scenery, for some miles, continues fine, but towards Corwen assumes a tamer appearance; and at last gets so flat and dreary, that the traveller who, like ourselves, has been up all night, may be excused if for an hour or two he go quietly to sleep. About five miles beyond Cernioge[a] he must wake up, and open wide his eyes, for it is impossible to make too much use of them:—rock and ravine, mountain and valley, verdure and barrenness, the dead and silent lake, the roaring rapid, the mad and leaping waterfall, follow each other in quick succession, or crowd altogether on the view, with a splendour that cannot be imagined.

We stopped at Capel-Curig about three; and after dinner

[a] Pronounced Canny-oggy.

ascended the mountain at the back of the inn. Under stones we found beautiful green varieties of *Notiophilus quadripunctatus*, *Omaseus orinomum*, *nigrita*, *rotundicollis* (Steph. MS.), *Patrobus rufipes*, and a few other *Carabidæ*. We also observed the beautiful little plant *Pinguicula vulgaris*, growing in great abundance on the wet and boggy parts of the mountain. Having reached the summit, we saw the whole mass of the Snowdon mountains in unclouded majesty before us. The air was slightly hazy; but not sufficiently so to interfere in the least with the magnificence of the outline. As we descended, we observed a belt of clouds passing between us and Snowdon, a thousand, or perhaps fifteen hundred feet below the highest peak. On our return to the inn we found a botanical friend[b] of ours, who, with a party of his relations, had arrived during our absence; and with whom we immediately fixed on ascending Snowdon the following morning. In the evening, we took several *Phryganeæ* flying about the river; and among them the beautiful *Philopotomus scopulorum*, and a large *Perla* apparently *marginata*.

9th. The party who had arrived last evening kindly gave us seats in their carriage from Capel Curig to the pass of Llanberris. We three naturalists then commenced the ascent on foot, accompanied by a guide named David Jones, an incipient insect-collector of great promise. In the first quarter of an hour, we had taken *Carabus glabratus* and *arvensis*, *Steropus Æthiops*, *Helobia Marshallana* and *Gyllenhalii*, *Elater cupreus* and *pectinicornis* (the former is in great abundance, both sexes of each), *Telephorus Æthiops*, a *Byrrhus* apparently undescribed,[c] and several other insects we had neither of us before taken.

We now found, by the masses of clouds which rolled in grand and billowy succession down the mountain-side, that we might shortly expect rain: and scarcely had we arrived at this conclusion, when rain, hail, and snow, or a compound of the three, began to fall around us in torrents, and very speedily

[b] William Christy, Jun. Esq. of London.

[c] Byrrhus Alpinus, Newm. *ater; elytris lævissimè punctulatis; lineis undecim longitudinalibus elevatis.*

B. pilulæ simillimus, at paulo major; caput, thorax, elytra, abdomen pedesque nigri, pilis aliquot albidis.]

Habitat in montis *Snowdon* graminibus; Junii diebus frequens.

wetted us all to the skin. After deliberately proceeding through this kind of weather, with sundry falls, and divers bruises occasioned thereby, for about an hour and a half, we reached a little stone hovel, erected by the workers of a copper mine as a shelter for themselves and their tools. Here we stood awhile, cold and drenched with wet, and held a consultation or council of war—the usual consequence of a defeat. We were three quarters of the way up the mountain; it continued to rain and hail in torrents; there was no prospect of shelter elsewhere, whether we proceeded or returned; we had neglected to take with us any spirits, in spite of the advice of the waiter at the inn; and now we found out our error: for wet, cold, wearied with the long, laborious, and slippery ascent, and sore with repeated falls, we really seemed to need some renovating influence from within to counteract so many ills from without. To proceed or to return were equally uninviting. Whilst in this state of uncertainty, the rain suddenly ceased. We sallied forth at once, and were unanimous in our determination to proceed. The path was now steep and stony; the clouds, like huge curtains obeying the impulse of an invisible line, rolled up the mountain sides in the same majestic manner in which, a short time before, they had descended; and, through an aperture, we gained a glimpse of the country below—crag piled on crag, interspersed with lake and mountain-stream, bathed in sunshine, and altogether gloriously glittering with the recent rain. The view was grand but transitory: the clouds again rolled down the precipices—the fairy scene was gone—and we reached the summit of Snowdon, enveloped in so thick a cloud that we could scarcely distinguish each other when standing close together. On the flag-staff, and under stones, we found abundance of *Helobia Marshallana* and *Patrobus rufipes*. The ladies of our party, who had gone on to Llanberris to procure horses, now joined us, to our great gratification; and kindly supplied us with sandwiches and wine, which we found particularly acceptable. It is a little remarkable, that, in their ascent of the mountain from Llanberris, they had not had a single drop of rain.

In descending, the *Helobiæ* were running about in all directions among the stones; but we were too wet and cold to pay much attention to them, especially as our bottles were

previously pretty well stored with them. When we had reached some hundreds of yards below the summit, we found the heavy cloud which had enveloped it had completely disappeared, and all above us was clear blue sky. The country below us was also visible in places, through openings in the clouds. The green lake, so remarkable, as many of our readers may recollect, for its deformed fishes, presented a curious appearance:—a stratum of rain-clouds was passing over it, although far below the spot where we stood; and its whole surface was in a kind of simmer with the heavy rain, at a time when the sky above us was beautifully clear and cloudless. In the Coppermine-lake we exercised our water-net, and took three water-beetles, *Hydroporus Davisii*, *Colymbetes fontinalis* (a singular variety, without the usual ochreous spots on the elytra), and another *Colymbetes* resembling the very common *C. bipustulatus*, but differing in some respects; and, as we cannot find it described, we have given its characters below, and purpose assigning to it the name *Snowdonius;* the name *nigro-æneus*, which precisely describes its colour, being pre-occupied.[d] After leaving the lake, we found the *Carabi* and *Steropi* running about in great abundance, both in and after the rain, which now recommenced; they were evidently preying on worms, which were tempted by the moisture to make their appearance. Under stones we found *Elater riparius*, and a few, not uncommon, *Coleoptera*. In our descent, we also remarked a beautiful rainbow, which, though in the evening, and therefore a goodly arch, reached not to the sky in any part, but was wholly visible against the side of a mountain. On our return to Capel Curig, we were completely overcome with wet and fatigue, and were right glad to get rid of our wet clothes and go to bed.

10th. Breakfasted early, and walked through the Cwn Glassor Pass of Llanberris: on the road took *Oëstrus bovis*, *Carabus glabratus*, *Byrrhus sericeus*, *Elater cupreus*, *&c.* The morning was fine and warm; the air, clear. Snowdon was occasionally visible; but there were some clouds about, and always below,

[d] Colymbetes Snowdonius, Newm. *nigro-æneus, lævis, capite posticè punctis duobus ferrugineis.*

C. bipustulato simillimus, at minor convexior ac posticè angustior. *Maris* elytris striis obsoletè elevatis. Totus nigro-æneus, antennis pedibusque piceis.

Variat interdum, (exemplariis crudis) elytris piceis.

Habitat in montis *Snowdon* aquis; Junii diebus frequens.

its summit. The Pass of Llanberris is superb. On the right rises Glyder, tumultuously, ruggedly, and abruptly, more than a thousand feet. On the left, the Snowdon mountains, with all their peaks, are piled together in indescribable grandeur and confusion. Some of their naked and black peaks, inaccessible to man, are the abode of the buzzard, the sea-mew, and raven, which may ever be seen wheeling in circles over and around them; and the shrill cry of the hawks, the harsh screams of the mew, or the hoarse croak of the ill-boding raven, are almost the only sounds which these wilds ever know, except, occasionally, the cheerful cry of the Welsh girl to her cows as she brings them home to milk, or the echo of their lowing. The mountain-streams in this region were particularly beautiful. You may, from below, trace their winding leaping course for hundreds of feet down the side of a precipice, white as driven snow, and looking in the distance no wider than a piece of tape. Having nearly reached the village of Llanberris, we turned to the right and ascended Glyder, the mountain under which we had passed. At first, the ascent was but moderately steep, and, being covered with a fine soft turf, afforded us a good and secure footing. Here we took the most splendid varieties of *Carabus arvensis*, brassy, coppery, blue, purple, green, and jet black; we found also several *Silphæ*, besides *Steropi*, *Omasei*, and other *Carabidæ*, running in the sunshine. After an ascent of several hundred feet, the character of the mountain completely varies: it presents nothing but a surface of loose sharp stones, and becomes so nearly perpendicular that the only mode of progression is on all fours, and severe work we found it. A pleasant sight we should have afforded to some of our brother entomologists of Cockney-land, whose researches are confined to Copenhagen brick-fields, or the wilds of Battersea cabbage-gardens. Our view from the summit, over Anglesea, and the sea beyond, was very fine; but the peep over the precipice, into the Pass of Llanberris, was really awful: human beings in the road could no longer be recognised as such without a glass, but appeared like black specks. Our principal motive in seeking this spot had been to find *Chrysomela cerealis*, which our botanical friend informed us had been taken under stones, and on the *Juniperus nanus*, which grows here in profusion; we were, however, unsuccessful: but in directing our course from hence towards Capel Curig,

we espied a single specimen sunning itself on a stone in an indented gully or hollow, which appeared to have formerly been the channel of a river or brook, and over the bottom of which similar stones are scattered throughout its length, which appeared to be at least half a mile. By a good deal of perseverance we succeeded in taking nine others, all in similar situations. Should this meet the eyes of an entomologist who proposes making a similar excursion, he must remember the locality is in a right line between the point of Glyder which overlooks the Pass of Llanberris (to which point the guide will be sure to take him), and the inn at Capel Curig, about five hundred or seven hundred yards from the point, and on a nearly flat part of the mountain.

In descending Glyder, we took abundance of *Colymbetes fontinalis*, in the clear streams of the mountain. These little beetles were difficult to secure, eluding our hands by an instant retreat under the stones; and the situation was one in which it was impossible to use a water-net. In these streams we also observed some large soft white larvæ, apparently those of a *Tipula*. This day was fine until the evening; when it began to rain.

11th. It rained the whole of this day: nevertheless we proceeded, clad in cloaks, to the waterfall of Rhaider-y-Gwennol, about three miles from Capel Curig; and, on our way, took some *Phryganeæ*, among them specimens of a very curious genus, perhaps *Chimarra* of Dr. Leach: the upper wings have a raised oblique line on them, giving the insect a very unusual appearance. We shall not venture on a description here, as the whole subclass is at present undescribed. Should it prove an unknown species, we venture to propose the specific name of *Cambrica*. In the afternoon, we went to a meeting of the sect, called Jumpers,[e] and we certainly cannot express our

[e] The clergyman begins preaching pretty deliberately at first; but, as he warms with his subject, his enunciation becomes excessively rapid. The congregation at first groan; then, in different parts of the meeting, both men and women begin to preach, lifting up their hands and arms, and brandishing them about with a tremulous motion; then they jump or jerk themselves up and down as they stand, uttering strange sounds, until at last the noise and agitation of the assembly become really frightful. Before the service ended, at least twelve persons, besides the parson, were preaching at the top of their voices, and with a rapidity I have never heard equalled. The groaning, mixed with occasional screams, and the tremulous quaking motion, continued throughout. We observed many present were laughing outright at this exhibition.—E. N.

approbation of this singular mode of worship, but were much pleased with the pretty appearance of the Welsh girls, in their dashing beaver hats, and snow-white caps and handkerchiefs.

12th. Rained all day. We returned to Shrewsbury; and thence to Leominster. While dining at Corwen, we heard a most remarkable thunder-clap; the lightning and thunder appeared to be simultaneous; the thunder was as loud as the report of a cannon, and was followed by little or no reverberation.

13th. Showery: collected round Leominster: took more *Pachyta collaris* and *Atherix Ibis* in the same localities, also *Tenthredo vidua* and *punctum*, *Sapyga sexpunctata*, &c. With the water-net, in the River Lug, we took *Colymbetes maculatus*, *Hydroporus depressus*, *Haliplus elevatus*, *Hydræna pusilla*, *Hydrobius bipunctatus* and *globulus*, *Helophorus viridicollis*, and several other water-beetles; on the blossom of the chamomile, in a wheat-field, *Phalacrus æneus*, and by sweeping, *Leachiellus* and *corticalis*. In the evening, we mothed, for a short time, in Eton Wood, and took very fine specimens of *Abraxas ulmata* and *Emmelesia alchemillata*.

14th. Showery day: Dinmore-hill. On this finely-wooded hill we took several good insects; *Throscus dermestoides* and *Lamprias chlorocephala*, beaten out of the broom; *Cephus satyrus*, out of the oak; *Pachyta octomaculata*, apparently asleep on the blossoms of the *Viburnum opulus*, in great abundance; *Rhagium bifasciatum* and *vulgare* on the same flower; *Clytus arietis* was remarkably abundant; *Empis pennipes*, *Dioctria ælandica*, and several *Tenthredines* and *Ichneumones*.

15th. Briarly Wood. Steady rain; which however did not deter us until we found the roads impassable for mire. We took *Tillus ambulans* on a whitethorn hedge; *Oxyporus rufus*, in some *Fungi*; *Mordella abdominalis*, on *Umbelliferæ*; and, in a wheat-field, *Agonum plicicolle*, and a great number of *Agonum parumpunctatum*, the variety which Marsham has called *Carabus cærulescens*: we observed, these are generally smaller and run slower than *parumpunctatum*; the apex of the elytra, we perceived, was, in some lights, slightly ochreous.—Why is not A. *cærulescens* a species?

16th. Olden Barn.[f] We were fortunate in a really fine

[f] The property of the writer's father.

day. On this beautiful farm, and on our way to it, we captured a number of insects; and among them several species of *Carabus, Leistus, Harpalus,* and *Amara,* a new species; *Anchomenus, Badister, Bembidum, Omaseus anthracinus,* and several others; *Synuchus vivalis; Odontonyx rotundicollis; Elater pectinicornis, cupreus, tessellatus, nigrinus, testaceus, sputator, rufipes, holosericeus, murinus, ruficaudis, marginatus, limbatus,* &c.; several *Malthinus* and *Anaspis;* abundance of *Tetrops præusta, Bombylius ctenopterus, Tabanus micans.*

18th. We paid another visit to Dinmore Hill, and were more fortunate in the weather than on the former occasion. We took a great number of *Pachyta octomaculata* in the same locality as before; *Lamprias chlorocephala; Ægeria culiciformis,* both sexes. On returning through the meadows we took some good Diptera; *Bombylius, major* and *minor,* in the standing grass; *Criorhina asilica,* and *Berberina* on *Umbelliferæ;* a single specimen of *Gomphus vulgatissimus,* a great number of *Telephorus flavilabris:* we also killed a very large female adder, rather a rarity in this county.

19th. Rained all day, or nearly so. We ventured out for about an hour, and took *Sphæriestes ater; Xyletinus striatus,* on a gate-post; *Sinodendron cylindricum,* in a decayed willow; *Coccinella globosa,* on a blade of grass; and, in the evening, *Abraxas ulmata,* and a fine specimen of *Chaonia dodonea,* in Eton Wood.

20th. It rained in torrents all last night: but notwithstanding this, and the black and threatening appearance of the clouds, we ventured once more to Olden Barn. In addition to the former captures, we obtained *Osmylus maculatus* (fine specimens) and *Polyommatus Acis;* of the latter rare butterfly, five specimens only, four of which were females: we found them in a rich meadow, on a hill-side. We took *Chrysotoxum arcuatum, Epipone spinipes,* and several other *Diptera* and *Hymenoptera:* we swept *Magdalis ater* out of the grass; *Tethea duplaris* off the alder, &c. &c. We saw it raining continually, during the day, on all sides of us, but were fortunate enough to escape.

21st. We repeated our visit to Briarly, and had a finer day. Our principal takes were, *Cephus satyrus, Sapyga sexpunctata, Ino statices, Euclidia Glyphica* and *Mi, Tachina viridis,*

Porphyrops fenestratus; the last was sporting over the pathways, the moisture of which it seemed completely to enjoy. They were in great numbers, and resembled little animated pieces of silver dancing about gracefully in the air. In the afternoon we took *Pogonocherus nebulosus* on a blade of grass, and the larva of *Catocala promissa* on the stem of an oak.

22nd. Thoroughly wet day. During a short interval of rain, walked to the river Pinsley: found it overflowing its banks, and observed some *Coleoptera* crawling up the blades of grass out of the way of the water; took several *Liophlœus nubilus*, and one fine specimen of *Cistela Ceramboides*.

23rd. Wet morning: started for Worcester.

24th. Dry blowing day.

25th. This day we had scarcely an hour's rain. We started early in the morning; and, after breakfasting at Malvern, ascended the hills. After the Snowdonians, these little turfy lumps, which one might run up, without taking breath, appeared insignificant. The view from the top, over Herefordshire and Worcestershire, is very rich. We found but few entomological rarities:—*Elater æneus, Notiophilus quadripunctatus, Cychrus rostratus*, &c., and an immense quantity of the larvæ of *Cucullia verbasci* on the *Verbascum nigrum*.

26th. We left Worcester per mail; and 27th, arrived in London.

N.

ART. X.—*Alphabet of Insects, for the Use of Beginners.* By JAMES RENNIE, M. A. *Professor of Zoology, King's College.* William Orr. London. 1832.

A LITTLE work, briefly, accurately, and familiarly explaining the first rules or principles of Entomology, has become quite a desideratum to the science. The number of students has of late years rapidly increased, while the diffusion of information has by no means kept pace with the desire to obtain it. An Entomological Primer, or Grammar, was loudly called for; and it was a matter of importance that it should be published at so easy a price, that no objection could possibly arise on that score, even from those to whom the outlay of a few shillings was a matter of consideration. The name of Mr. Rennie, as Professor of Zoology at King's College, and as a

public lecturer on this particular branch, seemed of itself a recommendation, especially to numbers of young persons, who had been delighted with the wonders they had heard of, for the first time, from the Professor's own lips. Every circumstance, therefore, combining to induce the public to patronize the Alphabet of Insects immediately on its appearance, it becomes the duty of an impartial critic to point out how far it is really worthy of that patronage: in doing this, we shall excuse ourselves from making any comments on the censures bestowed by the author on Cuvier, Latreille, Kirby, MacLeay, Swainson, and other eminent naturalists, and endeavour to ascertain whether his own knowledge of the subject will warrant him in speaking of these great men so disparagingly.

We find, at p. 18, the *antennæ* of an insect called its *ears*, without any previous explanation of the Professor's reasons for making this grand alteration in the supposed use of an organ; an alteration which strikes an entomological reader as forcibly as though he found in a figure, representing the human frame, the hands called eyes, or the eyes hands. Naturally anxious for the explanation of so strange a supposition, we searched through the book, and found the following paragraphs bearing on the subject:—

"The sense of *touch* has been, by many, supposed to reside in the organs I have ventured to call the ears, which have thence been termed feelers: but the evidence on which this rests is slight and unsatisfactory; for the bending of the ears forward, and moving them in walking, seem to be for the purpose of listening." Pp. 79, 80.

"For the brief reasons assigned under 'Touch,' and for others deduced from dissection and experiment, I have ventured to call the *ears* two horn-like organs, always situated near the eyes, to which various incongruous functions have been assigned. As I have little doubt these organs will one day be proved to be ears, I think it will direct attention more decidedly to them by at once terming them ears, than by leaving them open to all sorts of crude fancies, so easy to form, but so detrimental to correct inquiry." Pp. 80, 81.

We request our reader to give his attention to this. *The bending of the antennæ forward, and moving them in walking*, is sufficient reason, the Professor thinks, for their being considered ears! The reasons *deduced from dissection and*

experiment, when adduced, shall receive our attention; until then, our own positive knowledge, and the corroborating testimony of *all* great naturalists, will *in*duce us to believe, as before, that insects use antennæ as feelers, and not as ears. The idea that it will *direct attention more decidedly to them, by at once terming them ears*, is erroneous. If you assign an improbable, we may say, impossible use to any member, it merely excites ridicule, not attention. We could readily prove that the antennæ are feelers, if it were an object of importance; but the occasion before us does not call for argument.

We proceed:—

"Each bone of other animals, moreover, is well known by a distinct name: but the pieces of the skin in insects have only been recently examined; and the few names already given to the pieces are not well determined, and still in much confusion." P. 20.

We know not whether the Professor be really ignorant of the profound, accurate, and invaluable labours of entomologists on the "pieces of the skin" (what an expression!), or whether he fancies he has detected some error in them: we strongly suspect the former. This, however, we do know, that the subject is one which has been thoroughly and most satisfactorily elaborated.

"The human skin is formed of three layers, the scarf skin, the mucous net-work, and the inner skin. In insects only two layers are usually obvious, the inner somewhat resembling the mucous net-work of the human skin, and, like that, being the membrane of colour." P. 21.

We have the learned work before us, from which these observations are taken: it is a most valuable and accurate remark, but is not applied to *insects*. It refers to *Annelida*, a totally different class of animals; and it happens, most unfortunately, to be the exact opposite of what holds good in insects, as our Professor would have perceived further on in the same work. The colouring matter is the uppermost coat of all in *insects*, and is spread very thinly over the surface; so much so, that it may often be scraped off with a knife, or even washed off with spirits of wine.

"A considerable number of insects are clothed with hair or down, inserted, as in other animals, into the skin. It seems useful in keep-

ing bees warm; in preventing the water from soaking into water-beetles: and may also possess electrical uses which we cannot trace." P. 21.

Insects are cold-blooded animals: no cold injures them: water beetles are without hair or down. The electrical uses of the hair we leave, until the Professor has invented a theory on this point.

"Most of the names" (of the parts of the thorax) "are confused, inappropriate, and bad. I shall endeavour to be as plain and simple as I can." P. 25.

The Professor, in his laudable endeavour to be simple, uses such expressions as "fore-back-plate," "hind-breast-plate," "six pair of flanks," "haunches," &c. in the thorax; terms which, were they to come into use, would render the science a mass of unintelligible contradiction.

"*Note.*—In Latin, Epistoma. In Latin, Epimera." P. 27.

We need hardly say, these are not Latin at all. The Professor derides scientific names whenever he happens to know them. All the synonyms thus given are equally inaccurate.

"In beetles, and some other insects, the abdomen is joined to the corslet," (the Professor's name for thorax,) "without any joint to permit motion." P. 35.

This blunder we have before seen in print: the Professor, therefore, may plead plagiarism as his excuse. Need we say, that in beetles it is not the case. "Other insects" we leave, until we are informed what insects.

We frequently find the Professor sadly out in the application of descriptive terms: he says, the ears (antennæ) are, "as to their direction, stiff or flexible," p. 38; "as to their form, downy, bristly, or hairy," p. 39.

After hinting at the theories of Lamarck and Savigny, of one race improving or degenerating into another, and adding that "English naturalists are far behind in logic and generalizing," the Professor proceeds:—

"I have stated this in order to prevent misconception, which, from the imperfection of terms, is but too apt to mislead a genuine field-observer, and is certain to mystify and bewilder a compiler or a cabinet naturalist." P. 43.

We know not what "is stated to prevent misconception:" we leave our readers to discover. We acknowledge "misconception is apt to mislead a genuine field-observer; and is certain" (the "Alphabet of Insects" is an excellent example) "to mystify and bewilder a compiler."

"These jointed members" (the palpi) "are called feelers, though the term is objectionable, because their use is not well ascertained." P. 44.

This is admirable, after the antennæ have been called by the Professor "*ears*," because they are bent forward and moved in walking. The Professor considers *their* use well ascertained.

"I think the feelers" (palpi) "on the under jaw, &c. may be more plausibly considered the organs of touch." P. 80.

This is very like a contradiction to the last quotation we gave; but we find the Professor not very particular on these subjects: perhaps he will explain it.

"In earwigs, there is a forked member on the last ring, the blades of which are moveable, and which *are*" (the Professor is not at all nice about grammar,) "said to be used for folding up (rather, I should think, for unfolding) the wings, which are, for the most part, concealed under the short wing cases." P. 57.

The forceps not only is not, but cannot, be used for any such purpose. This idea, to a naturalist, is perfectly ludicrous.

"It" (the winglets or alulæ,) "is sometimes double; that is, two to each wing, like a bivalve shell. It" (we understand the Professor has a Conspectus of Grammar in a state of great forwardness) "does not, as has been supposed, produce the buzzing of flies." P. 55.

That these alulæ do produce the loud buzzing noise made by flies, recent experiments have proved almost beyond a doubt. The fact has for years been considered as settled; and we know not what right the Professor has thus to contradict an established fact, without even condescending to attempt a reason for so doing.

"Consequently, there is not, and cannot be, any real or direct circulation of blood in insects; though a claim to the discovery of such a circulation has been lately made, upon very slight grounds, by Professor Carus, of Dresden." P. 67.

This is an interesting subject. The circulation of blood in insects has been, until lately (notwithstanding the remarks of Professor Carus), considered very doubtful. The brilliant discovery has, however, been at length made by an English naturalist, J. Bowerbank, Esq.; and it is found to be as beautifully perfect, and the pulsations as regular, as in the human system. Mr. Bowerbank has delighted us by a sight of this extraordinary phenomenon; and we trust shortly to see a statement of it in detail laid before the public. The Professor was rather hasty in the conclusion, that there "*cannot* be a circulation of blood in insects." We did not expect the Professor would be aware of the fact; but he need not have decided on its impossibility. It has a long time been known, by naturalists, that circulation must exist, to prevent the putrefying consequences of stagnation; but its existence has hitherto, we acknowledge, wanted proof.

"Insects have the two sexes as distinct as the larger animals; and, in many respects, are similar to birds, as far as pairing is concerned." P. 82.

We have been practical collectors of insects for thirty years, and have not met with these instances of pairing, or any instances of similarity to birds. The fact, which we are not now disposed to dilate on, is the reverse of the statement.

At p. 90, and sequel, we find the Professor changes the usual terms, *Larva*, *Pupa*, and *Imago*, to "*Infancy of Insects*," "*Adolescence of Insects*," and "*Adult stage of Insects*," because he will never adopt Latin or Greek words, when Saxon ones can be obtained, and because he considers that "of all vulgarities, pedantic vulgarity is the most offensive." (!) p. xii.

"Butterflies seldom live longer than a few days." P. 97.

Rhamni lives twelve months; Io, Atalanta, Cardui, Polychloros, &c., nine months; the other British butterflies, two to three months.

Professor Rennie concludes his Alphabet by abusing system-makers and systems without mercy. He rejects the system of Fabricius as complex, that of Linnæus as indistinct, and modern systems as hypothetical; and then gives us his own views of the subject. He describes the bee-parasite, Stylops,

as having "four unequal wings, the first and second pair hooked together." p. 102. Stylops has but two wings: they are not hooked together.

"Wingless insects. 1. Those with the hind legs formed for leaping; bed-fleas, bird-fleas, dog-fleas. *Note.*—In Latin, *Thysanura* (Leach).

"2. Those with tail bristles, formed for leaping. In Latin, *Anoplura*, (Leach)." P. 104.

The Thysanura of Dr. Leach, and subsequent writers, have not their hind legs formed for leaping. The order does not include bed-fleas, bird-fleas, or dog-fleas. The Anoplura of Leach, and others, have no bristles formed for leaping; nor has any previous author so asserted. The words Anoplura and Thysanura are Greek, not Latin.

Here we bid the Alphabet "farewell." Had it been written by an unknown hand, we had passed it by as unworthy of notice. As it is, the popularity of the author entitles him to a review; and we have, to the best of our abilities, given him a fair one. On the Continent, we fear this work will be considered a specimen of British research in this science, because emanating from a Professor of Zoology. By this article, our neighbours will see the value in which the Professor's fellow-countrymen estimate his labours.

To British Entomologists we feel we ought to apologize for having so long detained them over so worthless a publication: but we can assure them the task is any thing but a grateful one, and has been undertaken solely from a sense of imperative duty.

Art. XI.—*Monographia Ægeriarum Angliæ.* By Edward Newman.

[Obs. This article was intended as a supplementary chapter to "Sphinx Vespiformis;" but a difficulty in unravelling some of the synonyms prevented its appearance with that work, and a hasty and very imperfect conclusion was published in its place: supposing this chapter added, the previous one would have terminated at p. 51, with the words "pointed out."]

The divisions and subdivisions in Natural History are, and ever must be, in some degree, subject to the caprice of the nomenclaturist. It is his duty to examine carefully what has previously been done,—to reject what is worthless,—to retain

what is valuable,—to invent, where there exist previously no intelligible combinations. A writer, who fears to innovate where he finds innovation necessary, fails in his duty to the public, as much as he, who, for the temporary fame it may bestow, proposes genera and species, which, before the discriminating eye of science, fall instantly to the ground.

The adoption of natural orders, or rather the formation of natural orders, out of the genera or sub-genera of Linnæus, was, when I ventured to propose it but a few weeks since, considered visionary and problematical: now, I am happy to find, that feeling is fast dying away, and the necessity for some such division is rapidly becoming obvious to all.

The division of natural orders into natural families, never exceeding seven in number, is the next step: and here let me remark, that occasional deficiency in the number seven is no objection; while the detection of a greater number of families, in a supposed natural order, will at once prove that that order is not established on sound characters. The natural order *Cossi*, of which the larva and pupa have been already described,[a] contains but four families, at present known as inhabitants of this country. A fifth is European, and two others, I have good reason to believe, exist in Extra-European climates; but I feel unwilling to hazard any opinion about these at present. I shall not, therefore, even suggest names for them; knowing that what is done prematurely has, most commonly, to be done twice.

Characteres Familiarum.

FAMILIA I. Adhuc ignota.

II. Palpi prominentes, triarticulati: antlia thorace longior: antennæ plerumque thorace longiores, post medium crassiores: abdomen plerumque barbatum: alæ hyalinæ . . . ÆGERIIDÆ, *Steph.*

III. Palpi minus prominentes, triarticulati: antlia nulla: antennæ thorace breviores, a basi ad apicem gradatim attenuatæ: abdomen barbatum: alæ opacæ . . . . . STYGIIDÆ, *Newm.*

IV. Palpi nulli: antlia nulla: antennæ brevissimæ, setaceæ: abdomen haud barbatum: alæ anticæ opacæ, posticæ semi-hyalinæ . HEPIALIDÆ. *Steph.*

V. Adhuc ignota.

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[a] Sphinx Vespiformis, p. 41.

VI. Palpi indistincti, fere nulli: antlia nulla: antennæ breves, setaceæ, a basi ad medium bipectinatæ: abdomen haud barbatum: alæ semi-hyalinæ . . . . . ZEUZERIDÆ, *Newm.*

VII. Palpi distincti, triarticulati: antlia nulla: antennæ mediocres, sub-pectinatæ: abdomen haud barbatum. . . . . COSSIDÆ. *Newm.*

These families correspond with the five genera described by M. Latreille in the *Regne Animal*, under the names *Sésies, Stygies, Hepiales, Zeuzères, and Cossus;* all of them are good, well-defined, and distinct groups; *and, in the opinion of that eminent Entomologist, are of equal value.* I am the more desirous of impressing this on my reader, because the confining of families to a single species does, I acknowledge, imply, to a cursory observer, the existence of a somewhat too eager desire to subdivide.[b]

It will be observed, that, in these families, I adhere very nearly to what has already been done by that excellent entomologist, Mr. Stephens, whose arrangement of insects by far excels any other that has yet been carried into detail. In separating the genera *Cossus* and *Zeuzera* from *Hepialus*, I am only doing what is absolutely necessary; for the families *Hepialidæ* and *Ægeriidæ* are so complete and compact, when limited in their contents to the genera *Hepialus* and *Ægeria* of Fabricius, that the introduction of any other genus would not only entirely destroy their uniformity, but would completely nullify any characters designed for these beautifully isolated groups, by making them too comprehensive.

Mr. Stephens's family, *Ægeriidæ*, seems to me, in every respect, a natural family; and I may add, that this, and the neighbouring families, *Sesiidæ, Zygænidæ, Hesperiidæ*, &c. are excellent examples of this kind of group. In saying this, I do not pretend to know to what foreign genera Mr. Stephens would extend these families; I speak of them only as regards their British contents.

FAMILIA II. ÆGERIIDÆ, *Stephens.*

GENUS SPHINX, *Linnæus.* ÆGERIA, *Fabricius.*
Trochilium, *Scopoli.* Sesia, *Laspeyres.*

OVUM—subglobosum glabrum.

[b] It may be observed there are many exotic species of each family.

Larva—subpubescens, pallida capite obscuriore, subdepressa, anticè incrassata, posticè attenuata: pedibus sedecim, sex thoracicis, corneis, glabris, acuminatis, validis: octo abdominalibus verruciformibus; duobus posticis porrectis inutilibus: habitu Prioni vel Cerambycis larvæ non dissimilis: admodum pigra, et ob exilitatem pedum intermediorum ferè meatu expers: victus è cortice, medulla lignoque arborum et fruticum, in quibus vias sibi excavat: domicilium suum non nisi metamorphosin aditura relinquit: metamorphosin aut in terra ad radices arborem et fruticum, in quibus vitam degerat, aut in ipsa vetere habitatione subit in folliculo serico cylindrico, terra vel scrobe aucto in quo per aliquot hebdomadis haud mutata quiescit.

Pupa—elongata, cylindrica, scabra; abdominis utrumque segmentum duabus ordinibus dentium minutorum, peracutorum dorso armatum; in motibus vivida.

Imago—*palpis* triarticulatis basi incrassatis, apice acuminatis; *antliam* corneam, involutam, filiformem, bifidam includentibus: *antennis* subcylindricis, ante apicem incrassatis, apice ipso acuminatis, fasciculoque setarum aliquot rigidarum præditis: *ocellis* duabus hemisphericis, pellucidis, minutissimis, ad superiorem oculorum marginem: abdomine elongato cylindrico, apice sæpius barba triloba instructo: pedibus longioribus, spinis armatis: alis anticis angustioribus, posticis brevioribus, omnibus plerumque hyalinis: vivacissima; miranda velocitate radiis solaribus volat, sedendo tamen florum nectar haurit, sub perpetua alarum abdominis pedumque motione: coitus diurnus in floribus sæpè diu durans.[c]

These characters are, I conceive, sufficiently clear; yet it may be as well to point out the real differences between this group and those to which they appear to approach. The family *Ægeriidæ* bears a very close resemblance to the Hymenopterous subclass *Tenthredo*. It must be evident that in this case there can be no real relationship; a glance at the primary characters[d] of each will shew at once that they belong to distinct and distant classes: yet if we take apparently approaching genera or species from each group, and arrange them side by side, the similarity is so striking and so continual, that

[c] These characters, as well as those of species hereinafter given, are in part taken from Laspeyre's *Sesiæ Europeæ;* but in no instance without a comparison of the characters there given with nature; and additions, omissions, or alterations have been made wherever they appeared desirable.

[d] Sphinx Vespiformis, p. 23. Character of imago.

something more than accident must have induced it. A design, a trace of system, is undeniable; every peculiarity of form and colour, possessed by one group, is assumed in so extraordinary a manner by the other. In this country, the tracing of these similarities from indigenous specimens is attended with some difficulty, owing to the paucity of our species; yet the similarity between *Ægeria Apiformis* and *Cimbex* or *Sirex*, and between *Conopia Myopæformis* and *Tenthredo neglectus*, &c. is too obvious to escape the notice of the most cursory and superficial observer. This similarity is one to which the term "analogy" might, with some reason, be applied. Analogy is a term, as I have before stated,[e] generally misplaced, and scarcely ever understood. To be clearly intelligible it ought to mean, *a superficial similarity, which fails before the test of distinguishing primary characters;*—in fact, precisely such a similarity as exists between an *Ægeria* and a *Tenthredo*; whilst affinity,—a word equally misapplied,—might be defined *a positive similarity in intrinsic characters*, whether these characters be derived from either larva, pupa, or imago separately, or combine a description of all the three. Analogy extends no farther than to colour, size and general form,—in fact, to those most trivial of all distinctions by which we separate varieties, or perhaps sometimes species. Affinity, on the contrary, is to be ascertained only by a reference to those higher characters by which genera, families, orders, sub-classes, or classes are to be distinguished. Thus the same specific character might answer equally well for a *Tenthredo* or an *Ægeria;*[f] but no generic, or higher characters could possibly be applied with equal, or with any propriety to a genus of *Ægeriidæ*, or a genus of *Tenthredinidæ*. Therefore the similarity between *Ægeria* and *Tenthredo* is an excellent instance of analogy, as it ought to be understood;—the relationship between the families is evidently none.

Of a very different character is the relation between the *Ægeriidæ* and the *Sesiidæ*, which, it will be observed by a reference to the diagram,[g] are placed in close contact; yet

[e] Sphinx Vespiformis, p. 47. See also pp. 26, 27.

[f] For example, Ægeria aut Tenthredo, Sp. rubro-cingulata. *Antennæ nigræ ante apicem albæ: thorax niger, linea laterali albida: abdomen nigrum, cingulo rubro: femora nigra: tibiæ nigræ, macula extus alba: tarsi nigri: alis hyalinis, venis nigris.*

[g] Sphinx Vespiformis, facing p. 31.

even here the differences are so decidedly marked, that, as I have already stated,[h] I think even this approach, obvious as it is, ought to be considered a relation of analogy rather than of affinity. The perfect insects, it is true, in both families, fly in the hottest sunshine,—live on the nectar of flowers, over which they hover, spreading their equally fan-like tails, and humming with their equally transparent wings; yet the *Sesiæ*, like swallows, are ever on the wing: with porrected trunk they rifle the nectary of a flower without even attempting to settle. The *Ægeriæ*, on the contrary, must always settle before they can even unroll their trunk. The *Sesiæ* prefer Didynamious,—the *Ægeriæ*, Syngenesious, or Umbelliferous flowers; but, from habit, (to revert, as we ought, to metamorphosis,) we find the *Sesiæ* are produced from conspicuous highly-coloured larva, which have invariably their penultimate segment enlarged, and bearing a hard recurved horn; which have six corneous and pointed, and ten fleshy and strongly prehensile feet; which feed on leaves in the autumn, and, burying themselves in the earth, change, without a web, into perfectly smooth and motionless pupæ; and remain in that state through the winter, and until the following summer. The *Ægeriæ* are produced from almost colourless maggots, which have the penultimate segment diminished, and without any horn; which have six corneous and pointed, and ten wart-like and almost useless feet; which feed in the interior of the trunks of trees, throughout the winter and spring, and then, spinning a cocoon among their food, change into remarkably rough and vivacious pupæ, which, in ten or twelve days, produce perfect insects. Here, then, is an approach, too decided to escape the notice of even a tyro, and sufficiently close to have been acknowledged by all entomological writers, as one of affinity, yet totally unsupported by any intrinsic characters, whether of larva, pupa, or even of imago;[i] for, on a minute investigation, we shall find that here, too, all trace of similarity is lost.

Excepting in the prior states of larva and pupa, there is but little connexion to be found between the *Ægeriidæ* and the

[h] Sphinx Vespiformis, p. 42.

[i] It should be remarked that the *Sesiidæ* have the biarticulate palpi of a *Sphinx*,—the *Ægeriidæ*, the triarticulate palpi of a *Phalæna*. The neurations of the wings, also, evince a decided distinction.

other families which I have arranged in the same natural order. I am inclined to believe that many genera, formerly intervening, have become extinct, or are yet undiscovered: the most marked *hiatus* is between the *Ægeriidæ* and the *Zeuzeridæ*, the central *Cossidæ* being evidently, though not nearly, related to both of them; to the *Ægeriidæ*, by similarities in the palpi and antennæ; to the *Zeuzeridæ*, by similarities in the antennæ, legs, and wing nervures, and by the total want of mouth.

Another family having been formerly coupled with the one now under consideration, by one of the most talented entomologists that this or any other country has ever produced, I must not pass it by quite unnoticed. I allude to the genus *Zygæna* of Fabricius, included, by Dr. Leach, with *Ægeria*, under the name *Zygænidæ*; and Mr. Samouelle, compiling from Dr. Leach's papers, in his Compendium, assigns as a character to the family, "palpi long, separate, covered with long scales, or porrected hair."[k] These characters apply but very indifferently to *Zygæna;* and its whole habits and economy[l] are at variance with those of *Ægeria*.

Such, then, are the characters, and such the relations, real and supposed, of the family *Ægeriidæ*. After all, so weak are the bonds of alliance,—so far removed the only supposable approaches, that the family must be considered one of the most isolated that natural history affords; and as such I will now consider it, and only treat of it in relation to itself.

Following out the Septenary System, we look for a type or centre, around which to arrange all the species we are at present acquainted with. This offers, in *Sphinx Apiformis*[m] of Linnæus; and consequently, a genus to contain that species must be central, and six other genera arranged round it, or vacancies left should a deficiency appear. I fear there are those who will disapprove of further generic division in this family: but I think I have from the first been tolerably regardless of the opinions of others, and it is now too late to swerve from my object in order to propitiate private favour; and I would wish those who are ever ready to cavil on this

[k] Entomologist's Useful Compendium, p. 244.

[l] Sphinx Vespiformis, pp. 35, 36.

[m] When the Septenary System is thus reduced to units, as I may say, I find the largest species is invariably the type or centre.

point, to examine before condemning. It is my own opinion that a genus should be established for every species whose primary characters differ from those of its congeners: in the present instance it will be found, by a reference to exotic specimens, that none of the proposed genera are confined to single species; and, in three instances, the number of species amounts to seven. Five of the genera were established by M. Hubner in 1816.[n] The addition to the number, on my part, only amounts to two; and these two, I trust, will stand the test of that scrutiny with which, I doubt not, they will be favoured.

Characteres Generum.

GENUS VII. Palpi breves: antlia brevis, quasi imperfecta: antennæ thorace breviores, *maris* pectinatæ: abdomen crassum, haud barbatum . . . . . ÆGERIA, *Fab.*

V. Palpi elongati, articulo ultimo nudo, subtus emarginato: antennæ thorace paulo longiores, *maris* ciliatæ: abdomen barbatum, *maris* barba compressa, *feminæ* dilatata . . . . . PYROPTERON, *Newm.*

VI. Palpi elongati, articulis omnibus squamatis: antennæ thorace vix longiores, *maris* ciliatæ: abdomen medio crassius, vix barbatum . . . . . BEMBECIA, *Hubn.*

I. Palpi elongati, articulo ultimo lævissimè squamato: antennæ thoracis longitudo, *maris* subpectinatis: abdomen *maris* gracile, *feminæ* crassum et brevius, valdè barbatum, barba dilatata . . . . . SYNANTHEDON, *Hubn.*

II. Palpi elongati: antennæ thorace longiores: abdomen *utriusque sexûs* gracile, valdè barbatum: barba triloba dilatata TROCHILIUM, *Scop.*

III. Palpi elongati: antennæ thorace longiores, *maris* ciliatæ: abdomen *maris* medio compressum, gracilissimum, *feminæ* gracile, *utriusque sexûs* valdè barbatum: barba triloba dilatata . . . CONOPIA, *Hubn.*

IV. Palpi elongati subtus quasi angulati: antennæ thorace paulo breviores, *maris* bipectinatæ: abdomen crassum, vix barbatum . . . . . PARANTHRENE, *Hubn.*

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[n] Proposed in the *Verseichniss bekaunter Schmetterlingen*, 1816, where the other genera which I have adopted will be found. I am indebted to J. F. Stephens, Esq. for all the information I possess on the subject of these genera

Genus VII. Ægeria, *Fabricius.*

Palpi breves: antlia brevis, quasi imperfecta: antennæ thorace breviores, *maris* pectinatæ: abdomen crassum, haud barbatum.

The typical genus, as might be expected, partakes more of the characters of the typical family, than do any of its cognate genera. The formation of the antennæ is little more than a modification of that of the antennæ of *Cossus:* the beardless and heavy abdomen, the imperfect mouth, the minute palpi, and the general sluggish character, also evince the near relation of this family to the typical group. The restoration of the original name to this genus is unavoidable. The name *Trochilium*° was first applied by Scopoli to the whole of this family, and intended for those species to which I have applied it, and not particularly to the species *Apiformis* and *Bembeciformis.* The Fabrician genus *Ægeria,* also comprised the whole Family. Hubner was the first who separated these two species under the name, *Sphecia,* which name I should, as a matter of course, have adopted, had not I considered it imperative to give the Fabrician name to the typical genus, *i. e.* to the species which Fabricius himself considered typical: moreover, the family having already received the name *Ægeriidæ,* it is important that its central and typical genus should retain the derivative of that name.

Sp. 1. Æg. Apiformis. *Palpi flavi: caput flavum: thorax fusco-ater, anticè maculis duabus flavis: abdomen flavum cingulis fusco-atris.*

Apiformis. *Linn. Syst. Nat.* p. 804. Sp. 29.
Id. *Bork. Fab. De Geer. Esper. Lasp. Haw.* &c.
Id. *Steph. Ill.* (*Haust.*) Vol. I. p. 137. Sp. 1.
Id. *Curtis, B. E.* 372**.

of Hubner, and could not have given them here, had it not been for that gentleman's kind assistance. I should, perhaps, however mention, that I do not know on what characters Hubner's Genera are founded; my own were divided and arranged as at present, before I was aware that that great Lepidopterist had previously gone over the same ground.

° *Trochilium* was applied to this group from their fancied resemblance to humming-birds, and is not appropriate to *Apiformis* and *Bembeciformis,* nor intended to refer to them: these were included to save sub-division. *Vid.* Scopoli's *Entomologia Carniolica.*

Caput flavum: palpi flavi: antennæ fusco-nigræ, subtus ad basin ferrugineæ, interdum flavescentes: thorax fusco-niger, anticè maculis duabus quadratis, posticè duabus minoribus obscurioribus flavis: abdomen flavum, segmentis primo quartoque fuscis, reliquis tantum margine fuscis, quinto ultimisque duobus in dorso fuscescentibus: femora intus fusca, extus flava: tibiæ fulvæ, incrassatæ: genua fusca: tarsi fulvi: alæ anticæ hyalinæ, supra testaceo subtilissimè irroratæ, basi puncto flavo, venis marginibus lunulaque ferrugineo-fuscis, cilia fusca.

Habitat in Anglia, haud infrequens: larva albicans linea dorsali obscura: sub corticem Populi nigræ et tremulæ victitat: imago diebus 23 ad 28 Junii insedens truncis.

Sp. 2. Bembeciformis. *Palpi fulvi, caput atrum, thorax fuscus, collari flavo, abdomen flavum, cingulis duabus fuscis.*

Bembeciformis. *Hub.* T. XX. f. 98.
Id. *Ochs.* II. 126.
Id. *Curtis, B. E.* 372*.
Crabroniformis. *Lewin. Haw.*
Id. *Steph. Ill.* (*Haust.*) Vol. I. p. 138. Sp. 2.

Caput atrum: palpi fulvi: antennæ nigræ, subtus ad basin ferrugineæ: thorax fusco-ater, collari punctisque duabus flavis: abdomen flavum, cingulis duabus fusco-ferrugineis: femora fusca: tibiæ fulvæ incrassatæ: tarsi fulvi: alæ hyalinæ, flavescentes, venis marginibus strigaque transversa ferrugineis.

Habitat in Anglia rarissimè: larva albicans puncto fusco in plurimis segmentis versus pedes: sub corticem Salicis capreæ victitat: pupa fusca: imago Julio insedens in truncis.

The specific name, *Crabroniformis*, given to this insect by Lewin, appears to have been prior to the one I have adopted; but that name having been previously assigned to a species of the genus *Paranthrene*, it cannot be retained for the present insect.

Genus V. Pyropteron, *Newman.*

Palpi elongati, articulo ultimo nudo, subtus emarginato: antennæ thorace paulo longiores, *maris* ciliatæ: abdomen barbatum, *maris* barba compressa, *feminæ* dilatata.

This appears to me to be a most decided genus, the remarkable structure of the apical joint of the palpi being so very

different from that of any other species with which I am acquainted; yet M. Hubner has not thought proper to separate it from his genus *Bembecia*, which combined this species with those in the two following genera.

Sp. 1. Pyrop. Chrysidiforme. *Palpi baseos nigri, apice ochracei nudi: abdomen nigrum cingulis duabus albidis: alæ squamosæ croceæ, macula lineari hyalina.*

Chrysidiformis. *De Villars, Ent. Lin.* T. II. p. 103. n. 28. Tab. 4. Fig. 18.
Id. *Bork. Esper. Hub. Haw. Ochs.*
Id. *Stephens, Ill.* (*Haust.*) Vol. I. p. 141. Sp. 4.

Palpi baseos hirsuti nigri, apice nudi pallidè fulvi: antennæ fusco-nigræ, subtus dilutiores basi albæ: thorax niger, pectus nigrum immaculatum: abdomen nigrum, cingulis duabus albidis: barba nigra, media parte lutea: femora nigra: tibiæ croceæ: tarsi flavescentes: alæ anticæ suprà squamosæ croceæ, linea longitudinali medio hyalina, marginibus et macula nigris.

Habitat in Mauritania et Italia frequens: in Gallia australi rarissimè.

I have described this insect, more because I wished to give an example of the genus, than from any conviction of its being a native of this island. It appears to have obtained a place in a cabinet as British; but it seems scarcely probable that an African insect, although naturalized on the warm shores of the Mediterranean, should have found its way into our colder climate. It was a common and very culpable practice of collectors formerly, to fill the spaces left in their cabinets for rare British insects, with some foreign species nearly allied to the British ones that were wanting; a circumstance which subtracts greatly from the value of all old specimens, the history of which has not been authentically recorded at the time of capture. This species is closely allied in habit to the foregoing; it is a heavy dull insect: Laspeyres describes it as "*pigrum et sensu ferè expers.*" It also very nearly approaches the genus which follows; and to the genus *Paranthrene* several characters pronounce its relationship.

Genus VI. Bembecia, *Hubner.*

Palpi elongati, articulis omnibus squamatis: antennæ thorace vix longiores, *maris* ciliatæ: abdomen medio crassius, vix barbatum.

This is another genus, which I have ventured to separate from the *Bembecia* of Hubner, retaining, however, his name, as the only British species referable to it is the one to which that author has assigned the leading or typical situation. Its beardless abdomen is an excellent character, and demonstrates its natural situation to be between the typical *Ægeriæ* and those *Phalænæ*, which are entirely without this peculiarity.

Sp. 1. Bemb. Ichneumoniformis. *Palpi flavi, abdomen fuscum cingulis sex flavis, alis apicibus maculaque media fulvis.*

Ichneumoniformis. *Fab. Ent. Syst.* T. III. P. I. p. 385. n. 22.
Id. *Fuess. Bork.* &c.
Id. *Curtis, B. E.* 53.
Id. *Steph. Ill.* (*Haust.*) Vol. I. p. 140. Sp. 3.
Vespiformis . . . *Esper. Haw.* &c.

Palpi lutei, apice fuscescentes: antennæ *maris* fuscæ, medio paulo pallidiores, *feminæ* medio flavescentes, subtus ferrugineæ: thorax fusco-niger, collari, linea longitudinali et litura transversa juxta abdominem flavis: pectus fuscum immaculatum: abdomen fuscum, *maris* sex, *feminæ* septem cingulis flavis: barba valdè, indistincta; fusca, medio pilis aliquot flavis: femora fusca: tibiæ fulvæ, macula versus apicem nigra: tarsi suprà flavi, subtus pallidè fusci: alæ anticæ suprà venis et marginibus fuscis, puncto ad basin, apiceque flavis: lunula transversa extus, margoque inferior crocei.

Habitat in Anglia rarissimè: larva adhuc ignota.

This insect varies very much in size, and in the colour of the antennæ. Mr. Bently has several specimens, which at first sight appear somewhat different; but, on examination, possess all the distinguishing characters of this species.

Genus I. Synanthedon, *Hubner.*

Palpi elongati, articulo ultimo lævissimè squamato: antennæ thoracis longitudo, *maris* subpectinatis: abdomen *maris* gracile, *feminæ* crassum et brevius valdè barbatum, barba dilatata.

Sp. 1. Synan. Œstriforme. *Palpi flavi extus nigra linea, abdomen nigrum,* maris *quatuor cingulis flavis, barba nigra,* feminæ *tribus cingulis flavis, barba flava.*

Œstriformis.	*Naturforscher.* VII. p. 109. n. 3.
Id.	*Esper. Europ. Schmett.* T. II. Tab. XXIII.[p] Sup. V. Fig. 3. p. 181.
Id.	*Bork. Hub. Pap. d'Europ. Haw.*
Cynipiformis.	*Esper. Bork. Haw. Ochs.* (*Sexus alter.*)
Id.	*Steph. Ill.* (*Haust.*) Vol. I. p. 141. Sp. 5.
Vespiformis.	*Vieweg. Tab. Verz. Fuess. Laspeyres.*
Asiliformis.	*Naturg. Bork.*
Chrysorrhæa.	*Don.* IV. Pl. 116. (S.)
Tipuliformis.	*Berken.* Vol. I. p. 132. Sp. 9.

Palpi flavi, extus nigra linea: antennæ nigræ, articulo primo subtus flavo: thorax niger, linea laterali longitudinali flava: pectus macula laterali flava: abdomen nigrum, *maris* quatuor cingulis flavis barba nigra, *feminæ* tribus cingulis flavis barba flava, femora nigra: antica extus flava; tibiæ flavæ, annulo nigro: tarsi flavi: alæ anticæ, suprà ad basin puncto flavo, venis marginibus fasciaque transversa intus nigris, apice fasciaque transversa extus croceis.

Habitat in Anglia infrequens: larva albicans capite fusco, sub corticem Quercus roboris et Betulæ albæ victitat: imago in Junii diebus flores frequentens.

Genus II. Trochilium, *Scopoli.*

Palpi elongati: antennæ thorace longiores: abdomen *utriusque sexûs* gracile, valdè barbatum, barba triloba dilatata.

Sp. 1. Troch. Tipuliforme. *Palpi supra nigri, subtus flavi abdomen nigrum,* maris *quatuor* feminæ *tribus cingulis flavis, alis apice latè sed pallidè inauratis.*

Tipuliformis.	*Linn. Syst. Nat.* II. p. 804. n. 32.
Id.	*V. Tab. Verz. Bork. De Geer. Fuess. Esper. Hub. Haw. Lasp. Ochs.* &c.
Id.	*Steph. Ill.* (*Haust.*) Vol. I. p. 142.

Palpi supra nigri, subtus flavi: antennæ nigræ: thorax niger, linea laterali longitudinali flava: pectus macula laterali flava: abdomen

[p] The references to Esper and Hubner are frequently taken from Laspeyres' *Sesiæ Europæ;* but, through the kindness of J. Curtis, Esq., I have, on a former occasion, been able to compare these references with the works of those authors, and have been satisfied of their accuracy. The references to Linnæus, Fabricius, Borkhausen, Laspeyres, Ochsenheimer, Hawarth, Berkenhout, Kirby and Spence, Samouelle, Stephens, Curtis, &c., are from the works of those authors.

nigrum, *maris* cingulis quatuor angustissimis flavis, *feminæ* tribus: femora nigra: tibiæ nigræ, cingulo apicibusque flavis: tarsi suprà nigricantes macula flava, subtus flavescentes: alæ anticæ supra venis marginibus fasciaque transversa latiori nigris, apice latè sed pallidè inauratæ, venis nigris.

Habitat in Anglia frequens: larva albida, capite pedibusque fuscescentibus, in medulla Ribis rubri victitat, et interitum efficit: imago in flores involat.

Sp. 2. Troch. Muscæforme. *Palpi albicantes linea extus apicibusque nigris, abdomen nigrum, quinque aut sex cingulis flavescentibus.*

Muscæformis. *Vieweg. Tab. Verz.* I. p. 18. n. 9.
Id. *Esper. Europ. Schmet.* T. II. Tab. XXXII. Cont. VII. f. 5.
Philanthiformis. *Lasp. Ses. Europ.* XXI. p. 31. Fig. 25, 26, 27, et 28.
Id. *Ochs.*

Palpi albicantes, linea extus et apicibus nigris: antennæ fuscæ, apice nigricantes, medio pallidiores: thorax linea laterali longitudinali lutea: abdomen nigrum, cingulis quinque aut sex flavescentibus: barba nigra, lateribus flavescentibus: femora nigra, luteo varia? tibiæ nigræ, medio et apicibus flavescentibus: tarsi lutescentes: alæ anticæ supra venis marginibus fasciaque transversa nigris, fascia transversa extus puncto flavo.

Habitat in Anglia rarissimè: in Europa frequens diebus Maii et Junii in floribus, præcipuè Thymi Syrpilli.

The only British specimen of this insect that I have seen or heard of was taken in Devonshire, and is now in the cabinet of J. F. Stephens, Esq. who kindly permitted me to take the above description. The specimen is rather wasted, but I have not the least doubt of its being the *Muscæformis* of Esper. Its size is about that of the preceding species.

Sp. 3. Troch. Allantiforme. *Palpi supra nigri subtus flavi, antennæ nigræ, abdomen nigrum cingulo flavo.*

Allantiformis. *Newman's MSS.*

Palpi supra nigri, subtus flavi: antennæ nigræ: thorax niger: abdomen nigrum, cingulo flavo: barba medio flava, lateribus

nigris: femora nigra: tibiæ nigræ: tarsi fulvi, apicibus nigricantibus: alæ anticæ venis marginibus fasciaque transversa nigris, ciliis omnibus fuscis.
Habitat in Anglia rarissimè.

The only British specimen of this insect that I have ever seen or heard of, was taken at Greenhithe, by Mr. Chant, and is now in that gentleman's cabinet: from this specimen, the above description was taken by Mr. Chant's kind permission. I am unable to find, in any work, a figure or description that will agree with it. The *Scoliæformis* of Borkhausen, described and figured in his *Naturg. Europ. Schmet.*,[q] and also by Laspeyres, in his *Sesiæ Europeæ*,[r] more nearly approaches it than any species with which I am acquainted; but there are still such decided differences, that I cannot venture to assign it that name. *Scoliæformis* has the upper half of the antennæ of a pure white: in our insect they are black throughout. The thorax of *Scoliæformis* has a yellow line on each side: this is wanting in the insect before us. Again, *Scoliæformis* has two yellow belts instead of one, and the beard of its abdomen is externally yellow instead of black. Now as only females of *Scoliæformis* have yet been taken, and as Mr. Chant's insect is a male, it is possible that they may be the sexes of the same species; but the differences are too great to conclude that they are so, without some more sufficient evidence.

Sp. 4. Troch. Sphegiforme. *Antennæ antè apicem albicantes, abdomen nigrum cingulo albido.*

Sphegiformis. *W. V.* 305. 10.
Id. *Fab.* T. III. 383. n. 15.
Spheciformis. *Bork. Hub. Esper. Lasp. Haw.*
Id. *Steph. Ill.* (*Haust.*) Vol. I. 140. Tab. XI. Fig. 1.

Palpi supra nigri, subtus flavi, apice nigricantes: antennæ cœruleo-nigræ, supernè antè apicem albicantes: thorax cœruleo-niger,

[q] *Sphinx Scoliæformis. Alis fenestratis, anticis in medio macula magna rotunda nigro-cyanea: abdomine fulvo barbato: antennis a medio usque ad apicem albis.* Borkhausen. *Nat. Eur. Schmet.*, T. II. p. 173. n. 13, b. Vid. Tab. Fig. 2 et 3, *fem.*

[r] *Sesia Scoliæformis. Sesia alis hyalinis, anticarum marginibus maculaque nigris: abdomine barbato nigro, cingulo flavo, barba crocea: antennis apice albis.* Laspeyres. *Sesiæ Europeæ*, N. VI. p. 13. Vid. Tab. Fig. 1 et 2. *fem.*

linea laterali longitudinali flava: pectus cœruleo nigrum macula magna laterali flava: abdomen cœruleo-nigrum, cingulo albido: femora nigra, antica extus ad basin flava: tibiæ nigræ, spinis luteis, posticæ internè flavescentes: tarsi flavescentes nigro irrorati: alæ anticæ hyalinæ, supra apice, venis marginibus fasciaque transversa latiore nigris; cilia fusco-cinerea.

Habitat in Anglia rarissimè: imago reperitur Junii diebus involans in flores, vel sedens in Betulæ albæ truncis, cujus ligno larva victitat.

Mr. Stephens figures this species with two white belts. Laspeyres describes it as having but one; and the British specimens I have seen certainly have no more. Priority, as well as grammar, in this instance, demand the restoration of the original name.

Genus III. Conopia, *Hubner.*

Palpi elongati: antennæ thorace longiores, *maris* ciliatæ: abdomen *maris* medio compressum gracilissimum, *feminæ* gracile, *utriusque sexûs* valdè barbatum, barba triloba dilatata.

This Genus differs from the foregoing, in having a single red belt on the abdomen, and in having the abdomens of the males very slender in the middle; the palpi, also, are rather more incrassated at the base, and have a slightly angulated appearance, somewhat as in *Paranthrene.*

Sp. 1. Con. Myopæformis. *Palpi* maris *supra nigri, subtus albi,* feminæ *toti nigri, abdomine cingulo coccineo.*

Myopæformis. *Bork. Naturg. Europ. Schmet.* T. II. p. 169.
Culiciformis. *Hub. Esper. Haw. Ochs.*
Mutillæformis. *Lasp. Ses. Europ.* Fig. 15, 16, et 17.
Id. *Steph. Ill.* (*Haust.*) Vol. I. p. 142. Sp. 7.
Stomoxyformis. *Steph. Ill.* (*Haust.*) Vol. I. p. 143. Sp. 9. (*feminæ var.*)

Palpi *maris* supra nigri, subtus albi, *feminæ* toti nigri: antennæ nigræ: thorax cœruleo-niger: pectus macula magna laterali inaurata: abdomen cœruleo-nigrum, cingulo coccineo: femora nigra, antica extus lineola alba: tibiæ nigræ: tarsi pallidiores: alæ anticæ supra venis marginibus fasciaque transversa nigris.

Habitat in Anglia frequens, involans in floribus, et sedens in foliis Rubi idæi, cujus medulla probabiliter larva victitat.

Mr. Stephens appears to have confounded the female of this species with the *Stomoxyformis* of Hubner; from which, however, it may be at once distinguished by the want of two bright red longitudinal lines on the thorax. I have carefully examined the specimen described and figured by Mr. Stephens, and also those in the cabinets of Mr. Davis and Mr. Chant,[s] and compared them with others of my own taking, and I feel convinced that they are all referable to the present species. *Feminam Stomoxyformis, Ste., mare Myopæformis, Bork., copula conjunctam ter cepi.*

Sp. 2. Con. Formicæformis. *Palpi supra nigri subtus fulvi, alæ anticæ apice latè rubris.*

Formicæformis. *Esper. Europ. Schmet.* T. II. Tab. XXXII. Fig. 3 et 4.
Id. *Bork. Lasp. Ochs.*
Culiciformis. *Scopoli.*
Tenthrediniformis. *Esper. et Bork.* (altero loco.)
Formiciformis. *Villars. Haw. Steph. Ill.* (*Haust.*) Vol. I. p. 144. Sp. 10.

Palpi supra nigri, subtus fulvi: antennæ nigræ: thorax niger: pectus nigrum immaculatum: abdomen nigrum, cingulo coccineo: femora nigra: tibiæ nigræ, cingulo albido: tarsi supra nigri, subtus fulvi, apice pallidiores: alæ anticæ supra venis marginibus fasciaque transversa nigris, costa et apex rubri.

Habitat in Anglia infrequens: larva subpubescens, albida, capite caudaque fuscescentibus, in ramulis Salicis albæ victitat: imago salicetis.

The alteration of this name, as to the termination of the derivative, appears to me to have been not only unnecessary, but improper; *Formica*, not *Formicus*, being the generic name whence the present trivial name is derived. I have restored the original name.

Sp. 3. Con. Culiciformis. *Palpi* utriusque sexûs *subtus fulvi, abdomen nigrum cingulo coccineo.*

Culiciliformis. *Linn. Syst. Nat.* II. p. 804. n. 30.
Id. *Bork. De Geer. Esper. Lasp. Ochs.* &c.
Id. *Steph. Ill.* (*Haust.*) Vol. I. p. 143. Tab. X. Fig. 3.

[s] These specimens are referred to by Mr. Stephens as belonging to this species. *Illustrations of British Entomology*, (*Haust.*) Vol. I. p. 144.

Palpi supra nigri, subtus fulvi: antennæ cœruleo-nigræ: thorax cœruleo-niger: pectus macula magna laterali fulva: abdomen cœruleo-nigrum, cingulo coccineo: femora nigra: tibiæ nigræ: tarsi cinerescentes aut fulvescentes, apicibus nigricantibus: alæ anticæ suprà versus basin fulvæ, venis marginibus fasciaque transversa nigris.

Habitat in Anglia: larva subpubescens, sordidè alba capite fuscescente, sub corticem Pruni domestici et Pyri mali victitat: imago in floribus præsertim Viburni opuli.

Genus VI. Paranthrene, *Hubner.*

Palpi elongati, subtus quasi angulati: antennæ thorace paulo breviores, *maris* bipectinatæ: abdomen crassum, vix barbatum.

This genus differs also in having the anterior wings covered with scales, and consequently opaque; whereas, in every other genus, they have an appearance of transparency: in the approaching genus, *Pyropteron,* that appearance is nearly lost. Say, in his American Entomology,[t] asserts that the opaque or hyaline wings are merely a sexual distinction,—an assertion in which facts certainly will not bear him out: and M. Laspeyres suggests that all the *Ægeriidæ* have their wings more or less clothed on leaving the chrysalis,[u]—a suggestion by no means necessary, as the existence of perfectly hyaline wings is well established among the *Papiliones, Sphinges, &c.*

Sp. 1. Paran. Vespiformis. *Palpi nigri apice flavi, abdomen nigrum,* maris *cingulis quinque,* feminæ *tribus flavis.*

Vespiformis.	*Linn. Syst. Nat.* II. p. 804. n. 31.
Asiliformis.	*Fab. Bork. V. T. V. Fuesslin. Hub. Esp. Pap. d'Europ. Haw. Lasp. Ochs.* &c.
Id.	*Steph. Ill.* (*Haust.*) Vol. I. p. 139. Sp. I.
Œstriformis.	*Kirby and Spence, Int. to Ent.* Vol. I. Tab. 3. Fig. 2.

Palpi basi nigri, apice flavi: antennæ nigræ, subtus testaceæ, basi flavæ: thorax niger, collari, litura laterali, punctoque ad alarum anticarum basin flavis: abdomen nigrum, *maris* cingulis quinque flavis alternis angustioribus: *feminæ* cingulis tribus, æquidis tantibus flavis: barba vix conspicua atra, pilis aliquot flavis:

[t] Vid. Say's *American Entomology,* Vol. I. plate 19.

[u] *Alæ specierum plurimarum, imo ut opinor omnium, dum pupam relinquunt, minime hyalinæ, sed polline subtillissimo, facile detergendo, adspersæ sunt.* Laspeyres, *Sesiæ Europeæ.* p. 3, nota, [6.]

femora nigra, postica basi flava; tibiæ spinosæ, fulvæ extus, macula nigra: tarsi flavi apicibus nigris: alæ anticæ squamosæ, fuscæ, venis margineque superiori nigris, maculaque elongata in medio hyalina.

Habitat in Anglia rarissimè: larva sub corticem Betulæ albæ et Populi dilatatæ victitat: imago diebus Junii et Julii in floribus umbelliferis.

I have proved elsewhere,[x] I hope satisfactorily, that this is the insect described by Linnæus in the Systema Naturæ, under the name SPHINX VESPIFORMIS.[y]

POSITION OF THE GENERA.

I.

VI. II.

VII.

V. III.

IV.

ART. XII.—*Varieties.*

1. *Genus Amphimalla, Lat.*—SIR, Will you permit me to avail myself of your pages, to inquire of Mr. Curtis, why he suppresses the *Genus Amphimalla* of Latreille? It appears to me to be impossible to include in one genus, species the joints of whose antennæ do not agree even in number; when Mr. Curtis himself frequently makes the length of a joint of the antennæ a distinguishing character. I am, Sir, yours, &c. SCRUTATOR.

[SCRUTATOR will observe we only publish his postscript: his letter "On the State of the Collection of Insects in the

[x] Vid. Preface to Sphinx Vespiformis, p. 6.

[y] All information on the subject of this family of insects, whether new matter, suggestion of improvement in description, detection of error, or of any other kind whatever, will be thankfully received, and may be addressed to me "to the care of the publishers of the Entomological Magazine." There is scarcely any group in natural history of which the characters have hitherto been so loosely thrown together, the relations so utterly unknown, or unattended to, and the synonyms so perplexingly confused, as the one now illustrated; and, although I have taken considerable pains to be correct, I cannot but anticipate that some errors have still crept in.

British Museum" is personal, and we should make ourselves responsible for any pseudonymous attack. Ed.]

2. *Colias Electra, Lin.; a British Insect.*—Sir, By a comparison of the *Colias Edusa* of our cabinets with the Linnæan description of *Papilio Electra*, in the *Systema Naturæ*, p. 764, and also with the specimens in the Linnæan cabinet, you will find there is no doubt of their being the same insect; and therefore the name *Electra* ought to be restored. Your's, truly,

Edward Newman.

3. *Capture of Aspidiphorus orbiculatus.* — Of this rare insect, I captured two specimens in moss, from the edge of our forest, on the road leading from this place to Chelmsford, on the 17th of November last. No well-authenticated instance of its capture having yet been made known, I beg you will allow me to record my good fortune in the first number of your Magazine. Edward Doubleday, Epping, July 27, 1832.

4. *Constable's Miscellany.* — No. LXXV. of Constable's Miscellany, is entitled " The Book of Butterflies. Vol. I. By Captain Thomas Brown, F. L. S. &c." When the *second* volume is published, we shall notice the whole work in the regular way: at present, we can merely call the attention of our readers to the appearance of the *first*.

5. *New British Forms of Parasitic Hymenoptera.*—Mr. Westwood has transmitted us the characters of sixteen genera of Hymenopterous Insects, comprising two families which he has called, *Chalcididæ* and *Proctotrupidæ*. The paper is published in the August number of the London and Edinburgh Philosophical Magazine, p. 127, to which we refer our readers. The characters appear to us to be clear and good; and we have on this account the more to regret that Mr. Westwood has not given a finish to his undertaking, by a description of each species; as we have so often seen that genera thus proposed fall to the ground, from the difficulty in ascertaining to which particular genus any undescribed species is referable. The pages of this Magazine will afford Mr. Westwood the means of making his labours in Entomology better known. As to ourselves, we have long been acquainted with Mr. W.'s zeal and

industry, and have regretted that the public has never received the benefit of them. The Philosophical Magazine is first-rate in its peculiar walk: we have often been delighted and instructed by its pages; but among merely entomological readers, its very existence is unknown.

6. *Observations on Lucanus Cervus.*—The village of Lee, in Kent, appears to be a favourite habitation of this gigantic species of beetle; but some seasons seem peculiarly favourable to the production of the insect. On the 14th of June, 1831, I found a single male; and every day between that period and the 5th of July, I found one or more specimens. The evenings of the 23d and 24th of June, were those on which they were most numerous: many of them were taken on the wing, but generally crawling upon palings, or on elm and lime trees. The females are later in the time of their appearance than the males; the first I took was on the 21st of June, and they were not at all numerous until the evening of the 23d: even then they were few,—not more, on the average, than one to three males. The females come out later in the evening, and are more sluggish in their motions than the other sex: it is also worthy of remark, that I never took, or even saw, a female on the wing.

On the 23d of June, early in the evening, I took two males and one female; I placed them under a tumbler, and shortly after, both the males began to pay some attention to the female. The larger of the two, however, attacked the other with some spirit, pursuing him round the glass, and occasionally pinching him severely with his mandibles, and actually, with his powerful jaws, lifting him fairly off the table. The *smaller male* appearing to resign his pretensions, I withdrew *him*, and *the others* remained *in copula* about twenty minutes: but the male did not quit his hold of the female for many hours; during which period another act of copulation took place. The same evening, I took a small pair *in copula;* they remained in that state some hours. Subsequently to this, I have seen several other pairs in a similar situation.

On the evening of the first of July, I took five males all on the wing about a small extent of paling, on which a female was subsequently discovered. I have little doubt that the males were attracted by the female, which was one of the

largest I had seen during this season—the whole of the males were also large.

The variety of size in this insect is very remarkable. I have captured males so small as not to exceed 1 inch 4 lines in length up to 2 inches 2 lines; and females, from 11½ lines to 1 inch 8 lines, including every possible intermediate size.

They appear to prefer warm and still evenings, after hot days: then they are on the wing between eight and nine in the evening. I have never detected them flying earlier or later: and on cold and windy evenings, they are very rarely met with.

The fact is thus fully established, that the *Lucanus inermis* of Marsham is truly the female of *Cervus;* and from the many varieties taken in the same locality, it is also pretty certain that the *Cervus, grandis, inermis,* and other presumed species are really but one, varying in size, from some cause arising from their condition in the larva state.

It may not be uninteresting to remark a fact as to the vitality of this insect. I picked up a mutilated male on the 3rd of July. The abdomen was gone. I separated the head from the thorax and elytra, and was astonished to find my finger violently pinched by the mandibles: it continued to hold me tightly, frequently pinching, the antennæ also quivering, for a full hour. The following morning it did the same; and was not wholly without motion twenty-four hours after it had been separated from the thorax:—how long the abdomen had been lost, is uncertain.

A. H. Davis.

Nelson-square, Aug. 1, 1832.

7. *Zeuzera Æsculi found impaled on a Thorn.*—Sir, I have in my possession a female of the wood-leopard moth *(Zeuzera Œsculi)* which was found last month transfixed on a thorn. It was quite alive; but, of course, unable to disengage itself, as the thorn completely pierced the thorax transversely and came out on the other side. It was perfect, with the exception of the loss of one of the wings; the plumage was in tolerably good preservation. It must, I suppose, have been placed there by a butcher-bird *(Lanius collurio,)* which is not uncommon in the neighbourhood of Hampstead. If this, however, were the case, it is singular that it

should not have been devoured, and that it should have been in a perfect state; as I believe the bird thus impales its prey that it may devour it at leisure. Perhaps some of your correspondents may be able to give some information on the subject. I have found a *Bombus* impaled in the same manner.

Should you consider the above worthy of a corner in your Magazine, I shall feel happy in having communicated even so trivial a fact from the great Book of Nature, which is always open to those who are willing to read in it, and the minute perusal of which must always be an inexhaustible source of amusement and instruction.

WM. LONGMAN.

Hampstead, 16th July, 1832.

8. *Stephens* v. *Rennie and Orr, (Court of Chancery, Thursday, 19th July*, 1832).—SIR EDWARD SUGDEN applied, *exparte*, for an injunction to restrain the defendants from printing and publishing a work entitled, "A Conspectus of the Butterflies and Moths to be found in Great Britain." In support of the injunction, he read the affidavit of the plaintiff, which stated that he, the plaintiff, had published, and was still proceeding with the publication of a work of a similar nature, entitled, "A Synopsis of the Indigenous Insects of Great Britain," from which the defendants drew the principal part of their publication. That it was a piracy there could be no doubt, as the defendants confined their descriptive powers to those insects which had been already described in the volumes published by the plaintiff; and, when those failed them, they had nothing of their own to fall back upon, but were at a dead stand. A single glance at the two books would at once shew the propriety of this injunction being granted. In one part, where the plaintiff described an insect, by mistake, as with *oculi nudi*, the defendant described the same insect exactly in the same manner, copying the mistake, without any notice; but instead of using the Latin words they gave it in English. In another part, where a description of the insect, *Syenna*, had been, by a mistake of the press, given under the name of *Scoria*, the defendants still copied the mistake. The defendants, in some places, admitted that they took extracts from the plaintiff's work; but that did not alter the case.

THE LORD CHANCELLOR. — What proportion does the pirated part bear to the rest of the work?

SIR EDWARD SUGDEN.—It is a piracy throughout, from beginning to end.

THE LORD CHANCELLOR, on looking at the book, said that the author strongly recommended the plaintiff's book.

SIR EDWARD SUGDEN.—He does, my Lord; no one understands the value of it better than he does.

THE LORD CHANCELLOR said, that he should doubt whether the two works were addressed to the same class of persons. The plaintiff's seemed to be intended more for scientific persons, who could afford to pay 1*l.* 11*s.* 6*d.* for it; but the other was more for popular sale: and he much doubted whether it would interfere with the plaintiff's book. They might, however, take the injunction at present; but he was sure they would hear more about it.

[We think, in such a case as this, Entomologists should raise a subscription to enable Mr. Stephens to carry on his cause with vigour and effect. It is in this instance a private wrong; but who amongst us will hereafter venture on publishing the result of years' patient investigation and dear-bought experience, should the defendants succeed in removing the injunction?—ED.]

9. *Magazine of Natural History.*—This excellent work has lately been rich in entomological articles of great interest. The April number has a detail of captures by Mr. Dale, another by Mr. Davis, and a record of a most singular discovery of a hyperparasitical insect by Mr. Newman. In May, we have a notice of remarkable entomological forms by Mr. Westwood, some of which are strange in the extreme; the engraver of the figures has not conveyed the idea of *Mormolyce*; there is no separating line on the elytra as represented. The other cuts represent very tolerably the insects for which they are intended; the Greek derivations are ludicrously incorrect; some of these we see Mr. Westwood has since rectified. The Rev. W. T. Bree has three excellent articles in this number; in one of which, a review of "Insect Miscellanies," he points out in the most gentlemanly manner the deplorable ignorance of its author: we give a shrewd guess who that author may be, and though we fear he is beyond the reach of Mr. Bree's refined criticisms, we hail with delight the

appearance of a species of review, which can thus ably unveil a pretender to science, without descending to a coarse and personal attack. In June, we have miscellaneous records of captures, and a few disconnected articles by the indefatigable Mr. Bree. In July, "Notices of the Habits and Transformations of the Dragon-fly, by J. D.," is an amusing paper, and full of instruction to beginners. We refer our readers to the articles themselves, in which we are sure they will find abundance of instruction and amusement.

10. *Obrium cantharinum.*—Several pairs of this extremely rare insect have been recently taken at Broxbourne, Herts, by Mr. Bond, a diligent collector, Having met with one or two flying in an outhouse, he was induced to examine the building, when he discovered, from some holes in the rafters, that they were, in all probability, bred in the timber. On further examination, he found that the rafters were made either of the common poplar or the aspen, and, as is frequently the case in country buildings, had been used without stripping off the bark. On removing the bark, he procured several more of the perfect insect, and one larva. I have a piece of the bark which shows the path of the larva and the place of exit of the imago. The outhouse had been erected about eighteen months, and the timber had been purchased from the park of J. Bosanquet, Esq.

August 20, 1832. A. H. Davis.

11. *Vespa vulgaris.*—The predacious habits of the common wasp are pretty well known; but one or two singular instances of this character which have come under my observation, may not be altogether uninteresting.

In 1830, during a short residence at Snaresbrook, in Essex, I was much annoyed by the swarms of wasps which entered the house from an extensive settlement in a bank not far distant. I had placed the produce of an evening's mothing on a setting-board over the mantel-piece. On the following day, I observed a wasp fly in at the open window, and make immediately for the setting-board, on which it instantly alighted. I rose to ascertain its object, when I found it separating, with its mandibles, the wings of a moth from the trunk. I captured the wasp; and, on further examination, I discovered that the whole of the bodies of the previous night's captures

had been removed, and that the moth to which the wasp had flown on its entrance was the only one remaining. The pins and braces had kept the wings in their position, so that the depredation had not been discovered. It was perfectly obvious to me that the same wasp had paid previous visits to the board from the direct course which it took on entering the room, and its at once alighting on its prey. I also witnessed, in many instances, its capture of the common fly. The wasp having seized the fly, generally on the window, almost immediately commenced by biting off the wings and legs on one side, and then the other,—all the time buzzing against the glass. I have held my hand beneath, and caught the limbs as they were successively detached from the body. Having accomplished the task, the wasp as speedily as possible escaped, and made away direct for the nest.

A few days since, I observed one of this species on the Golden-rod, in a garden at Blackheath, suspended from a leaf by the claw of one of the posterior tarsi. The other legs and the head appeared actively occupied; and on closer inspection I observed that the wasp was in possession of a fly, and engaged in the operation of severing the legs and wings, while its own weight was suspended by the claw. On approaching nearer, the marauder flew off with his victim.

I have since witnessed a similar occurrence on the same plant, but the fly taken (*Eristalis nemorum*) was much larger. The wasp instantly suspended itself, and in less than half a minute had bitten off not only the legs and wings, but also the head. I captured the wasp as it was taking flight with its prey. A. H. Davis.

12. *Ixodes hexagonus.*—Sir, I have lately taken two specimens of *Ixodes hexagonus;* and as, from their peculiar habitat, I should imagine they are not generally known, I subjoin a description of them with a few observations.

I was examining a hedgehog, and was surprised to find, behind each ear, a large tubercle, as it then appeared to me; but, on examining more closely, I found they were the parasites I have mentioned above, firmly fixed by their rostrum, and the abdomen lifted up over the head, so that that was the only part of the animal I at first saw. They were so firmly fixed that I was unable to disengage them without cutting off

a piece of the hedgehog's flesh. Latreille says that they are either blind, or that their eyes are not apparent. I examined them minutely with a microscope, but was unable to discover their eyes: they must however possess these organs, or some delicate sense to compensate for their absence, since one of them, that I placed near a lamp, constantly turned away to avoid the light. They belong to the *Riciniæ*, Latreille's fifth family of Trachean *Arachnidæ*; their spiracles are two in number, one is placed on each side of the abdomen; they have eight six-jointed legs; the tarsi are didactyle; the thorax and abdomen are united, and are composed of only a single segment; the abdomen is by far the largest part of the body; in the front of it is an oval coriaceous plate,—the scutum; the palpi are two in number, large and oval, and are single-jointed; they must, I should imagine, live entirely by suction, in which they are probably assisted by the palpi; the rostrum is well adapted for maintaining a firm hold, as it is deeply serrated, the serræ pointing backwards. In this species, the head, legs, palpi, and the scutum are brown, and the abdomen a livid white.

Some of this genus lay a large number of eggs, which, according to M. Chabrier, pass through the rostrum. But here a question presents itself as to how they are originally placed on the animal. Are they attached to it from its birth; or how and when are they placed there, as their locomotive powers are so limited? Yours, &c. W. Longman.

13. *Insects captured at Shellness and Neighbourhood.*—Near the end of last month I took at Pegwell Bay, Shellness, and in the surrounding neighbourhood, the following insects:

Notoxus monoceros
Allecula sulphurea
Cicindela maritima
Broscus cephalotes
Calathus piceus
rufangulus
mollis
Platyderus ruficollis
Synuchus vivalis
Odontomyia viridula
furcata
Tabanus bovinus
Eristalis sepulchralis
intricarius
Gymnosoma rotundata
Megachile centuncularis
Willoughbiella
Allantus
Tenthredo
Cephus
Nematus, and several species of each.

Broscus cephalotes.—The habit of these insects is very curious; they are found only in the sand on the sea-shore, and live in dens about three inches deep and half an inch wide, which are made in a diagonal position in the sand, where it is mixed with decomposed stalks of *Elymus arenarius*. They appear to rove during the day occasionally, but, upon any

alarm, run swiftly to their dens,—projecting from the mouths of which their heads may be seen watching for prey. On holding another beetle to the hole, the one within would immediately seize hold of it with its jaws, and continue so tightly fixed as to suffer itself to be drawn out without quitting its hold. They appear to be very ferocious insects; and, from the number of elytra and other parts strewed about the sand, it may be supposed that they prey on each other.

Cicindela maritima.—I found this insect in great plenty on the bare sand, where it is overflowed in the spring and autumn by the high tide. It flies more heavily than the common *Cicin. campestris*, and not so far at a time. I remarked, also, that the abdomen hung down very much in flying. Growing among the *Elymus arenarius* I found a single plant of *Œnothera biennis*, the leaves and whole plant had a red fleshy appearance. It was several miles from any house or garden, and growing, as it is reported to do, in Lancashire. Can this be a new habitat? ROBERT FOSTER.

Bromley, August 1, 1832.

ART. XIII.—*Colloquia Entomologica.*

Γνωθι σεαυτον.

SCENE—*The Parlour at the Bull Inn, Birch-wood-corner.*

ERRO and ENTOMOPHILUS, *seated.*

ENTOMOPHILUS. Well, old gentleman, do you seem the better for it?

ERRO. I am going to take a look—(*opens his box*)—What, what, what! all in a buzz—whirling like teetotums.

ENT. There, Rocky, there's the last bit for you. Make haste and bolt it: there, don't let Mrs. Jewell see you eating, or else she 'll charge three dinners—there's a good dog!

ERRO. (*Still looking in his box, settling and shifting his insects*)—Eristalis floreus; come, be still! There he is, off again, w-whirr-rr-ee!

ENT. What a wretch!—(*taking out his boxes and balancing his chair on the hind legs, his head resting against the wall*)—Virens, Fullo, Sycophanta. I wanted duplicates of these.

ERRO. Mihi, my eye, mihi! Moffy, do you think these fellows have any feeling? They seem excessively merry—ee!

ENT. Why, *yes*, or rather *no*—but which do you think? I have Trichius nobilis though, really. Aspice! ecce! I took it on the elder-flowers, just out here.

ERRO. So it is! What, what, what!—Cistela ceramboides too!

ENT. I am inclined to believe that insects are perfectly insensible; that is, when any one maintains a contrary opinion—keep your wings still;—but if you think they have no feeling, like a hard-hearted savage as you are, come,—I'll kill you, a little, old fellow, if you keep on kicking that Geometra—if you think they have—(*a pause*)—they are, as I was saying, really indigenous;—I'll furnish you with facts, and prove by arguments hitherto unadvanced—I'll be whipped if he has'nt kick'd its head off!

ERRO. That's very clear; you should have been a pleader.

ENT. What?

ERRO. If I were to set my wits to work, I think I could prove that insects have feeling.

ENT. I don't—try—(*shutting his box and thrusting his hands into his breeches-pockets*).

ERRO. First, by analogy, all our ideas tend to confirm the probability of the existence of sensation in every creature; because, in ourselves, and in all those of whose peculiarities we can readily satisfy ourselves, we detect its presence without the slightest difficulty; and, it is only when the objects become minute, of a different structure, and cease, in consequence, to be within the precise range of the experiments by which we had tested, as it were, the sensation of higher animals, that we can entertain a doubt on the subject. Apparently, then, from analogical reasoning, truth is on my side: I claim the advantage. I say insects feel, because I feel. If you doubt, disprove: no insect, I suppose, ever told you that it could not feel when you were piercing it?

ENT. No.

ERRO. Then the positive disproof is wanting. Now we 'll suppose, still pursuing analogy, a similar operation performed on the human body: a man shall be laying quietly asleep; then comes a monster, some anthropologist with an anthropological pin, fifty feet long and two feet round—the parallel's a just one—and, with immense energy, forces the horrid weapon into him just on the right side of the vertebral column: ribs, lungs, liver, &c. give way, and are forced out of their places,

perhaps carried on the javelin's point twenty feet under ground—it's no exaggeration—don't smile;—what would be the man's feeling? I ask, what would be your feeling, Moffy, eh? What would you do?

ENT. Die!

ERRO. Yes, perhaps so. Yes, you certainly would. Then how awful must be the pain to a creature whose intense vitality supported it even in such a horrible situation. Life it certainly retains; but what a life, futile, indistinct, false, feverish—none of your smiles—writhing convulsively on a similar instrument; yet from some cause, at present unknown to us, capable of withstanding death—that is, immediate death: but death must follow at no great distance of time, embittered by pain and hunger, and in its most awful forms; sometimes sinking exhausted, after hours or days spent in struggling for liberty; sometimes, from numbness and inertness, the disruption of its vital parts being followed by a total loss of sensation.

ENT. Roey!

ERRO. Yes, excess of pain having worn out the nerves: sometimes from loss of blood; which you must often have remarked on the paper where the wretched sufferer has turned round and round in agony, but mostly from——

ENT.—steam—But really, Roey, excuse me; you make but a poor hand at defending a cause against your conscience. *You* would never do for the law: why, you have said nothing, literally nothing—smoke, mist, which rising before the sunlight of truth requires not even my weak breath to disperse; if, under circumstances which, you have very unnecessarily laboured to prove, would kill a man, an insect not only lives, but, struggling for liberty, whirls at the pin-head like a teetotum, and you are aware, although you have not advanced it, will eat and drink as heartily as usual; and, when liberated, will immediately pursue its customary occupations of sport, love, or industry! Why, how, in the name of fortune, do you make out any analogy?

ERRO. Don't stop, Moffy.

ENT. There is, then, some decided difference somewhere in organization: where is it? What is sensation, or rather where does it originate?

ERRO. In the brain.

ENT. In the brain—right. Now, in vertebrates, the brain

is a collected, a concentrated mass, enclosed within a bony skull, and situated at the anterior extremity of the vertebral column; in insects, on the contrary, it is in—

ERRO.—two nodules——

ENT. Pish! hush! excuse me, Roey, hear me speak—'tis no such thing, the brain is omnipresent; it is diffused, in ramifications, from the thorax to every extremity. Now, in vertebrates, from the brain emanate the nerves or organs of sensation. In insects, the brain and nerves, I firmly believe, are one and the same thing,—so—

ERRO. Reaum—

ENT. My dear fellow, allow me.—I am well aware that Reaumur thought differently; and that in this, all his copiers have followed him: and so they would had he represented one hind leg to contain the brain and another the nerves; but this is nothing to my purpose. I am not now going to propose, much less press, a new theory on that subject; yet mark me:—in vertebrates, an injury to the brain destroys feeling. Ask all the surgeons: they will readily convince you of this. Here, then, is proof positive that sensation emanates from, and is dependent on the brain. We will allow an insect, for argument's sake, all the acuteness of sensation the most tender-hearted would wish:—you, who were this moment going to quote Reaumur against me, must now abide by him: you will find your horrible weapon—

ERRO.——

Monstrum horrendum, informe, ingens, cui lumen ademptum.

ENT. Either listen, or translate your ideas into the vernacular.

ERRO. *Monstrum*, a stocking-needle; *horrendum*, rusted; *informe*, bent; *ingens*, as big as a Grecian javelin: *cui lumen ademptum*, broken off just below the eye.

ENT. I suppose that's wit! Ought I to laugh? But laughter increases wit, as watering a plant makes it grow. Well, you will find this horrible pin, or needle if you like it better, passes through the very sensorium,—the chief seat of the ganglions,—their union, their centre, their nucleus,—and thus gets foul of the main cerebral masses, and, carrying them away on its point through the insect, leaves them, perhaps, some considerable depth in the cork. Now this disruption,—this annihilation of brain,—must destroy the sensitive property of all nerves emanating from or centering in

that brain, precisely in the same manner as the destruction of the trunk of a tree must deprive its branches of vitality; and sensation, however acutely once possessed, must consequently inevitably cease.

ERRO. Well?

ENT. I have done.

ERRO. But I cannot let you off so easily. You suppose a fact, of the truth of which you acknowledge you entertain a doubt. You say, "allowing insects all the acuteness of sensation the most tender-hearted would wish," &c.

ENT. Are you serious? Deny insects feeling, what have I to disprove? You are less bright than usual, Roey: but I do deny that insects possess any sensation of pain like that with which we are acquainted; although, in doing this, I forsake an argument which I trust is incontrovertible. It is useless to dilate to you on the structure of an insect: you know far better than I; you have proved yourself the industrious bee, and have filled your storehouses with knowledge for the good of the hive. I, like the thoughtless butterfly, forsaking labour, gambol idly in the sunny air of science, and now and then stoop to sip its sweetest flowers for my own gratification. Observe for a moment the hard shell of "the shard-borne beetle," and reflect that the exterior of every insect is but a modification of this. The bones may be said completely to envelope the softer, and what would generally be considered the more sensitive parts. But there would be no necessity for sensitive internal parts, except as communicating with sensitive external parts; and we know that the Almighty has created nothing in vain. We therefore naturally expect to find sensation evinced, if evinced at all, on the exterior; and here we have only a hard resisting substance, uninjured by the severest usage,—our own hair and nails are tender in comparison,—our teeth are of somewhat similar texture. Now, Roey, as you dwell on analogies with such delight, allow me to offer one. Suppose a man enveloped entirely, eyes and all, in a coat like the enamel of one of his teeth,—you cannot imagine him very susceptible of pain; and a beetle is in precisely a similar case.*

* The tortoise is a strange connecting link between the *vertebrata* and *annulosa* in structure, and partakes of the peculiar tenacity of life and absence of sensation so observable in the latter.—ED.

ERRO. But a butterfly is not.

ENT. You are perfectly right; but yet you must often have observed at Darenth with what unconcern the bramble-delighting Paphia opens and shuts her wings in the sunshine, long after they have lost their original shape and colour, and are, in fact, little more than mutilated transparent tendons. This would never be the case, had she feeling in these wings: she must have long since died from such repeated mutilation.

ERRO. There is something in that; but may not the wing of a butterfly be analogous to hair or nails, as you suggested but now, in man, and therefore have no sensation?

ENT. I think not. The wings of insects have a membraneous texture, which, like those of the bat, partake of the properties of other parts of their frame: but surely you will admit legs to an equal feeling with other parts, and the loss of these is equally common,—you must have remarked it among the gnats?

ERRO. I have been willing to listen, Moffy, to all this, because I like to hear you talk; but I agreed with you before you began, and therefore needed not to be convinced. One argument, however, you have not availed yourself of, which seems to me even more strong than any you have used: it is this,—a beneficent Providence would hardly have subjected such hosts of creatures to the constant loss of members, did such loss cost to them the same anguish which it does to the larger animals. An insect, perfect in all its members, and a human being deficient in any, are almost equally uncommon.

ENT. Roey, it seems to me that entomology, particularly in this country, has never been raised to that station among sciences which it deserves: I fear it has not advocates which do it sufficient justice. How some of the dons would sneeze at me if they heard this! It has yet to become a science. But we are not really so low as the world about us believe: they would set us down with the auricula, tulip, pigeon, rabbit, and bull-dog fanciers.

ERRO. I understand even your own relations condemn your insect-hunting as a lamentably weak pursuit,—a strange waste of time,—a sort of half-madness.

ENT. They will be proud to own me some day or other. I do not think I am for a long life; and a few years after death

mellows down harsh feeling as well as fond:—a man rises or falls to his proper level as soon as it is known he can no longer have private ends to serve.

Erro. I hope so. Kirby and Spence did good in that line. What a work,—what a monument of industry and patient research, aided by sterling talent, guided by excellent judgment, and pervaded throughout by a kind-hearted, humble, meek, quiet, and most pious feeling!

Ent. Why do not you undertake something of the kind? A popular work, at about a fourth of the price, with all new matter, yet not to forsake truth for the sake of popularity.

Erro. That piece of advice is scarcely necessary to me,—is it, Moff? yet your extending the caution so coolly is an excellent satire on the taste of the present generation. I think, however, there is room for such a work; but you must not look to me:—you can't make a satin purse out of a sow's ear. One subject connected with entomology seems hitherto entangled in mystery,—I wish you would take it up.

Ent. What is it?

Erro. It wants a masterly hand. The line between reason and instinct has never yet been drawn, or even proposed, with any show of probability.

Ent. And yet nothing were easier. The concentrated brain meditates; the diffused brain acts.

Erro. Excellent in sound, but I only know of one individual on earth who dare attempt to found an argument on such a dictum, or whose attempt would be attended with the most distant chance of success; and that individual, dear Moffy, is —

Ent. More fools, they. People in general, Ro, muddle their heads with all manner of unintelligible works on a straight-forward, plain, intelligible subject. Instead of presuming or venturing to be original on this question, they give you musty quotations of high-sounding passages,—which have been long refuted and therefore done with,—and parade them as their own; like the jackdaw, that stuck the peacock's feathers in his rump long after the peacock had dropt them as useless: and thus ornamented, these fools think to pass for philosophers, when, in reality, they are, by thinking men, despised for adopting antiquated stuff, more worthless, if possible, than even themselves could have devised, had they

employed for that purpose the little brain which Providence had been pleased to allot them.

ERRO. I have often been amused to hear the talk of those who pass current for philosophers: it seems a heterogeneous conglomeration of the opinion of others learned by rote. In my opinion, the original thinker is the only philosopher—the man of books a mere parrot.

ENT. Your number of philosophers would be very small, methinks, Roey: I never recollect meeting with one.

ERRO. The learned fool, like an animal, lives on the gross food of earth; the original mind, like the more delicate plant, thrives on the breath of heaven.

ENT. I understand you, I think: but a granary and a mine were a more apt, though a less beautiful, simile. The book-learned head is a granary well stored from without; while the riches of a truly great and powerful mind are like those of a mine—its own. I never hear a good idea expressed that is not old to me; if new, I find it worthless. And why is this? Because men refuse to think: it is too hard work. Believe me, a thinker is as rare as a phœnix.

ERRO. And has ever been so. Plato, Aristotle, Newton, have been thinkers; perhaps Locke.

ENT. And, certainly, the younger MacLeay, the entomologist. From this fear, or dislike, or, shall I say it, incapacity for thinking, arises our present ignorance? What if you and I were parrot-masters of all that exists in print at this moment; we should not add one iota to the general stock of knowledge: and yet there is no man, no *soidisant* philosopher on earth, but would consider this the very climax of his wishes. Let us strike out a new road: let us strive, of our own resources, to enlighten what is obscure; to discover what is hidden. The desire to know, is the talisman whose touch solves mystery. The pursuit of truth ensures its capture.

ERRO. Instinct. Moff, you are wandering.

ENT. Ah! the statement I made, you seemed to think, required logic and argumentative powers to sustain: no such thing. Divest your mind of all the nonsense you may have met with in Essays on Instinct, and such trumpery, and look only at naked facts. Select a prominent example of each form; for instance, as a vertebrate with concentrated brain, the elephant; as an annulose with diffused brain, the ant. My dear friend,

have you never watched a lady's delicate fingers wander a voluntary prelude among the keys of a piano? and have you never thought the music more delightful than the most studied and elaborate harmony produced by the consummate and combined skill of composer and performer? So now let your mind wander a moment among the wards of your memory, in search of facts and anecdotes of the elephant and the ant: the result will be more convincing, more delightful far than the most abstruse and complex essay that man could compile. The elephant, you already find, premeditates; the ant is the creature of mere impulse.

ERRO. Allow me to suggest that insects alter their habits according to weather and other casualties.

ENT. I have heard that bees in the tropics cease to collect honey; that wasps, which build here underground, build there in trees. These fictions are copied from one to another, and will be to the last day, no doubt. They might as well say that men assume the tails of monkeys at the equator, and the horns of rein-deer at the poles. Naturalists, if consulted, would contradict such absurdities at once.

ERRO. Where is such precious trash to be found?

ENT. I don't know; I never read.

ERRO. Nor I, except Waterton's Wanderings. I can say that by heart, and am now learning to repeat it backwards. I have already learned the last journey perfectly.

ENT. How very interesting!

ERRO. You can't know a good thing too well. How gladly would I start on just such a pilgrimage as his to Essequibo. I never see the swallows gathering on the roof of the about-to-be-deserted house, or on the topmost twigs of the tree about to die, but I long to join these gay and giddy habitants of perpetual summer. My soul yearns for the primæval shades of Demerara, for the unclouded sun of Venezuela. How gladly would I leave my home, my country, my friends,—aye, even you, Moffy,—in this chilly inhospitable clime, and pursue my trackless way in company with Nature's self, through woods which none but the wild deer, or the wilder native, ever trod; where the king-vulture-mounted Mora rears its lightning-blasted and single branch into the sky,—a solitary but triumphant memorial of its quondam superiority over whole oceans of forestry.

Ent. We'll go together, Roey.

Erro. What mines of natural history those delightful regions contain,—mines hitherto totally unexplored; for in entomology what has yet been done? O, I long to watch the bright fire-fly illuminate the night, and the emerald butterfly blaze from flower to flower in all the radiance of a noontide sun!

Ent. We'll go together, Roey, that's certain.

Erro. I will find out for you the larva and pupa of Urania and Castnia, and all those arcana of our craft which at present envelope it in a mantle of mystery. I will send you, Moffy, from time to time, histories that shall make even Aristotle raise him from some thousand years' slumber to listen to. I will bring home thousands of insects never before heard of,—

> Quem qui scire velit Lybici velit æquoris idem
> Discere quam multæ Zephyro turbentur arenæ,
> Aut ubi navigiis violentior incidit Eurus
> Nosse quot Ionii veniant ad littora fluctus.

Ent. Speak the vernacular, Roey, pray. Your Greek and Hebrew is a sealed book to me, you know very well.

Erro. My *modus operandi* would be this: I would take up my residence on some hill-top surrounded with woods, and would spend all my time in collecting, and in observing nature pure and undefiled by the contact of man. I would live in friendship with the bear, the wolf, and the vampire. My life should be spent in discovering the glorious works of an Almighty Creator, and in unfolding them for the benefit of my fellow-creatures.

Ent. Noble idea; let me go too.

Erro. I should like a companion, but I fear it will not be

> ——————————— thine to stray,
> The friend and soother of my watery way;
> In the heart's solitude, more mute and drear,
> For all that howls and clamours on the ear,
> With one kind voice that desert to dispel,
> And turn to home a joyless cabin cell.

How often has fate, apparent chance, disappointed me even at the threshold of my hopes! How often, yielding to the wishes of others, I have myself conquered for a time the feeling—but every fall it returns with redoubled strength—*hæret lateri*

lethalis arundo. I cannot eradicate it; I cannot quietly jog along the every-day track which mortals have trodden for centuries.

> ———Tentenda via est qua me quoque possim
> Tollere humo; victorque virum volitare per ora.

And if I die of the yellow fever, or some she-jaguar takes me to feed her young ones; or, better still, some huge boa swallows me whole; why, it wont much signify, I shall leave behind no one that will care about me.

ENT. Not one?—think Roey. Have *we* never been sufficiently pleased with each other's company for each of us to take some interest in the fate of the other? I shall, at least.

ERRO. Yes, indeed have we; and recollection leaves a perfumed fragrance on my mind which will adhere to it long after this frail vessel of clay shall have lost its vigour:

> You may break, you may ruin, the vase as you will,
> The scent of the roses will cling round it still.

ENT. Would you do any geology?

ERRO. No. Geology is a tempting but dangerous study; you begin with wondering, and proceed through doubting to disbelieving.

ENT. It always has appeared to me that those geologists who plead the cause of the Bible have done more harm than good by their sophistries, their weak attempts to prove a coincidence between what is written and what is seen; and that they open a wider field for doubt by proposing theories so easy of disproof. In these cases, I believe what I read in the Bible, and what I see with my eyes; and if the results do not always agree so well as I could wish, I seek not to pervert or twist a meaning on the one hand, or disguise a fact on the other, for the sake of proving a correspondence between the two; but humbly and devoutly trust that whenever Time may open to us the book of Nature, we shall find its pages are in perfect accordance with those of the Book of Truth.

ERRO. What, after all, can a geologist learn? He merely scratches the surface like an old hen; he knows nothing of the interior; and, like the same animal, he chuckles over his useless labours.

ENT. Shall you write a book?

ERRO. No, no; a mere manuscript, for you, and Venator,

and Ambulator, and a few more of the right stamp to have a peep at. It would be far too wild and strange a concern for the scientific world: they would turn up their noses at it, until they exhibited to you what little brains they possessed through the apertures.

ENT. Too true: one must not say a word about natural history with a smile on one's face. Your scientific man must always be as solemn as an owl, and as long-featured as ———.

ERRO. And, to add mental to personal beauties, as stupid as the first, and as obstinate as the last.

ENT. You and I hold a different opinion; yet, Roey, I often think that, as we pass along through life, we ought to erect here and there by the way-side some little mark, just to show others where we have been:—"There lived a man" is but a poor memento.

ERRO. And yet how many spend a long life without performing one act entitling them even to the name of man. But, my friend, you are sure of a name; you have erected, even now in your early years, a monument, "*perennior ære.*" Content, aye, happy should I be, could I but grave my name thereon, ever so humbly, that the two names might drift together down the tide of time to the ocean of eternity, with the same unity our kindred spirits enjoyed while here.

ENT. Roey, ar'n't we getting a little bit sentimental and stupid? Come, come, what a deal of time we've been fooling away here—eh! Rocky, my man,—hark, hark! yoicks! (*the beagle, seated on his tail, gives tongue*) there's a mellow note! You must stay and pay the reckoning, Rocky. Three—recollect—don't cheat. I shall stick a cigar in my face; won't you, Roey?

ERRO. Not altogether fooled away. This half-hour's talk, however trivial, will add yet another link to the golden chain of memory, which, like an enchanted girdle round my thoughts, serves to cheer many an hour, that without its aid would be utterly miserable.

ENT. Happy the man, Roey, the chain of whose memory has none but golden links. He, at least, need never talk of misery; his cares must be all ideal. Here goes. (*Leaps through the open window.*)

ERRO. Cleverly done, indeed. I must try.

(*Exit in same style.*)

THE

ENTOMOLOGICAL MAGAZINE

JANUARY, 1833.

Art. XIV.—*On the Want of Analogy between the Sensations of Insects and our own.* By the Rev. C. S. Bird, M.A. F.L.S. *late Fellow of Trinity College, Cambridge.*

[Read in the Clarendon, Oxford, before the British Society for the Advancement of Science, June 20, 1832.]

It may not, perhaps, be thought inconsistent with the objects of the British Society for the Advancement of Science, if a few observations be made, tending to remove, or at least weaken, a very popular objection to the study of Entomology. Were this neglected, but beautiful field of nature more widely cultivated—could the students of Entomology be brought to bear any comparison in number with those of Botany, it is impossible to say to what extent science in general might ultimately be benefited. Who can tell what discoveries are in store, and only waiting till the foot of some fortunate Entomologist shall explore some untrodden tract? Need we call to mind how deeply Medicine is already indebted to what is commonly called the Spanish Fly, *Cantharis Vesicatoria?* Who knows how the debt may yet be increased? Need we recur to the Philosophical Transactions, a century and a half ago, in order to draw encouragement from the example of Ray? If he could elicit from the common ant what many celebrated writers contend is an acid *sui generis*, the formic, who can predict what other properties, which now lurk beneath the lovely exterior of the innumerable insects around us, may yet enrich that most wonderful of modern sciences, chemistry?

The objection alluded to is this—that Entomology cannot be studied without making a collection of insects, and that such a collection cannot be made without involving much cruelty. The former of these assertions may be allowed, but the latter may fairly be questioned. It is of the greatest consequence to question it, because it is in the mouth of every one who has paid no attention to the subject, and because it rises most readily to the lips of those, the goodness of whose hearts, and the warmth and simplicity of whose feelings, render them the most desirable converts, being the very persons who would engage in this delightful pursuit with the greatest enthusiasm if once converted. In self-defence too, it is absolutely necessary that an Entomologist, who lays claim to as much benevolence as others, should shun the questionable shape in which the objection presents itself to his mind at least. For my own part, I will claim more for the Entomologist, and will assert that his acquaintance with insects will increase his benevolence towards them, and will make him the last person in the world who would grudge the trouble of putting a spider or an earwig out of the window rather than crush it to death, or pass by the commonest fly or beetle floating on a stream without reaching out a stick to save it.

The charge of cruelty wholly rests on an implied assumption that we are capable of judging by outward symptoms of the sensations of insects, and that they occupy such a place in the animal kingdom as to oblige us to suppose that their sensations are like our own under like circumstances. Both these positions I deny to be tenable. I shall endeavour to prove, by popular arguments, unconnected with any inquiries into the anatomy of insects,[a] that the outward symptoms, by which it is hastily judged that pain is felt, are referable, if to any sensation analogous to ours, only to the instinct of escaping from restraint unaccompanied by pain; and, moreover, that there is so broad a line to be drawn between the lower part of the animal creation and the higher as to make it extremely doubtful whether there is any analogy whatever in their sensation. As my attempt to draw this line is new, at least to myself, I shall begin with that.

Few persons, comparatively speaking, are aware how diffi-

[a] This subject has been ably argued in our last article, p. 94, *et seq.*—Ed.

cult it is to draw the line which separates animals and vegetables, though every one supposes that he knows such a line, and admits into the pale of his sympathy all that lies on one side of it, whilst he entirely excludes all that lies on the other. Bishop Watson, in the fifth volume of that delightful work, which should be a model for popular writers on scientific subjects, his Essays on Chemistry, has shewn in a lively manner the extent of this difficulty. The late President of the Linnæan Society, Sir J. E. Smith, has also stated it in his Introduction to Botany. The presence or absence of a stomach, he observes, will not suffice to establish a distinction, for the polypus may be turned inside out, like a glove, and left in this state without any derangement of its functions. The power of locomotion is not an universal criterion, as many vegetables seem to possess it in a higher degree than the corals and corallines. In short, it has cost philosophers more trouble than is generally imagined, to give a definition of what is an animal. Sir J. Smith tells us that the only definition to which he had hitherto found no exception, is that of M. Mirbel, given in his Treatise of Vegetable Anatomy, that "plants alone have a power of deriving nourishment, though indeed not exclusively, from inorganic matter, mere earths, salts, or airs, substances certainly incapable of serving as food for any animals, the latter only feeding on what is or has been organized matter, either of a vegetable or animal nature. So that it should seem to be the office of vegetable life alone to transform dead matter into organized living bodies."

Admitting then, that the line can be drawn which separates animals from vegetables, I contend that another line should be drawn, almost as broad, which separates animals from each other. This line will be found at the point where there ceases to exist in animals a unity of being. In man, we are all aware, there exists this unity. There is nothing that a man is more conscious of to himself than his own identity. He knows that he cannot be in two places at one time, that he has a continued, uninterrupted existence, and that whatever acts he performs cannot be ascribed to another. The soul is immaterial and indivisible, but the body is not. Accordingly, if the body be separated into two parts, and life remain at all, it remains only in one and not in the other. One only of them can constitute the man, otherwise he would lose his identity. This

peculiarity of constitution we suppose to belong to the higher orders of animals as well as to ourselves, and if a leg be cut off from one of such animals, we never think of concerning ourselves about the leg or pitying it, we only pity the animal that has lost it. The very reverse of this is the case with a plant: there we take slips or cuttings, and form so many new plants, and whatever we predicate of one of these, we may of another, and we feel no compunction in performing the operation, because we conceive that no analogy exists between us and them. It is not demonstrable that they do not feel like ourselves, but we are content when we see this extraordinary divisibility to suppose that they do not, till it is demonstrated that they do. Now in this respect, worms approach very near to plants. It is said, that, if cut properly, a worm may be multiplied into many new worms. When we look at a worm, we are apt to look at it as one creature, but we are in reality looking at an aggregate of several creatures, which for the present are united, but may, if we please, be disjoined. What a mighty distinction does this create between us and them! How can we reason from ourselves to them? And if not from ourselves, how reason at all? Now this want of unity of being which thus makes worms approximate more to vegetables than to ourselves, is found in an inferior degree in insects. As this is the principal point which I wish to establish, I may be permitted to detail the circumstances which first led me to observe it.

When I was young in Entomology I wished anxiously to find the quickest mode of killing an insect. Having captured a pretty beetle, *Malachius Æneus*, it struck me, that, cutting it in two at the junction of the thorax and abdomen, the part which gives rise to the name Insect, *Insectum*, Εντομον, I should kill it in a moment. I took a pair of scissars, and divided it; the parts fell on a piece of white paper which lay before me. Far from being dead in an instant, I was grieved and surprised to see the head, with the two fore-legs attached to it, begin to run about the paper. It occasionally stumbled, but rose again, and exhibited, if I may so speak, perfect self-possession. It made for the edge of the paper, but arriving there, and looking over, it seemed to think it too precipitous, and so coasted along in quest of an easier descent, which nevertheless it did not seem able to find. This coasting and

searching for a convenient place of descent, suited to its curtailed condition with respect to legs, of which it appeared perfectly aware, occupied the head incessantly. I regarded it with astonishment. "Here then," I said to myself, as I watched its motions, "here lies the vitality of an insect!—the body at any rate is dead." But in this I was quickly undeceived; for in about a minute after the body had fallen on the paper, I saw the hind legs brought upward, and employed deliberately in brushing and cleaning the wing-cases, exactly as a house-fly may be seen to clean its wings on a window-pane. The legs were then withdrawn, the cases raised up, and the true wings expanded from beneath, and all made ready for flight, which indeed I expected to see; but the body, seeming then to become aware that there was no guide, the head, its former companion, being in possession of the eyes, the design was abandoned, the wings folded up in their usual beautiful manner, and the attitude of rest again assumed. This whole process was repeated with perfect regularity at intervals of about a minute, if I rightly remember. A more perfect act of a sentient creature could not be exhibited. The head continued to run about, and the body to clear and spread its wings, the one for about twelve, and the other for sixteen hours; their energies gradually decaying, till they appeared to perish, or rather to sleep. And now, I ask, Which was the beetle?—Where was the original creature?—Had not the head and the body an equal right to be taken as its representative? Is not all analogy between insects and ourselves destroyed by such a phenomenon? If a soldier were deprived of his arm on the field of battle, we know how to talk about the soldier still; we can compassionate his sufferings; we can admire the heroism with which he bears them; but if the arm were to exhibit animation and independence—if it were to strike an approaching enemy, or do such deeds as could not by possibility be ascribed to mere muscular action, what should we think of it, and, above all, how should we speak of it? Would not all ordinary language be at fault? What sort of a creature would the arm be? Would it be a human creature? Should we not be almost irresistibly impelled to introduce a supernatural, invisible agent, rather than attribute to the arm itself the actions we witnessed? I trust I have said sufficient to prove my point, that the want of identity in insects, their divisibility

into parts having separate independent consciousness, establishes a line of demarcation between them and the higher orders of animals, almost as broad as that which already confessedly exists between them and vegetables. I hope to be forgiven for having entered into details so simple; yet the results of which are so striking. I do not imagine that the facts are new; it is only the importance which I attach to them, and the inference I have drawn from them, that can pretend to any thing like novelty.

I must now hasten to the other point, which I trust I shall be able shortly to establish; namely, that even if there were no such line of separation between insects and the higher animals as to confound our reasonings with respect to them, and if we still think ourselves at liberty to judge of their feelings by outward symptoms, we have no cause, if we be not led away by first appearances, to conclude that they suffer pain. If in any case an insect feel pain, nothing, we should imagine, could call forth the feeling more than the act of passing a pin through its thorax, a part which we know to be peculiarly sensitive. It is, in fact, this very act of violence, equivalent to spearing a wild boar or a salmon, which is most revolting to observers; and if their compassion can be shewn to be misplaced in this case, they will hardly, I believe, appeal to any other. Now I have repeatedly pierced a moth[b] through the thorax, when it was in a quiescent state, taking care only to do it with a steady hand, and no abrupt motion; and the moth has taken no notice of it whatever. I have even lifted it up by the pin which transfixed it, and have carried it from room to room in the same state of motionless quiescence, and have shewn it in this state to those whose incredulity it was my object to remove. If we be to judge by outward symptoms in this case, where was the pain? The fluttering is the symptom, the only symptom, by which people in general are convinced that an insect is suffering; but here there was no fluttering. And then to shew, that even when it flutters we are not hastily to infer pain, I have suddenly and abruptly touched a leg or some other part of its body, but not so as to wound it, and alarmed the moth, after which it has began to flutter, and finding the restraint of the pin, has never ceased to

[b] Not one of those moths which, like some, if not all, of the Lithosiæ, counterfeit sleep or death when suddenly alarmed.

flutter more and more until I destroyed it. I conclude, therefore, that the violent struggles, which excite so much pity in us before we know their cause, are merely the effect of alarm, and display that strong instinct so necessary to insects for their preservation, by which they endeavour to avoid any thing strange, and to escape from restraint. If this conclusion be not thought inevitable, let me refer to Messrs. Kirby and Spence's Introduction to Entomology, for the mention of a fact, which though I cannot vouch for myself, I must believe on such good authority. These gentlemen tell us, that the head of a wasp has been known to eat honey after it had been severed from the body; and that the union of the sexes has taken place between bodies that have been deprived of their heads. If this be true, it settles the question at once. It demonstrates, that, under the worst possible circumstances, either no pain exists, or it is most easily superseded. On any hypothesis, therefore, the charge of cruelty in the destruction of insects seems to be refuted. Either there is no analogy whatever between them and us on account of the distinction I before mentioned with respect to their divisibility, or if we gratuitously suppose such analogy to exist, and are guided in our judgment solely by outward symptoms, we are compelled to confess, that insects can have no feeling of pain at all resembling our own.

It has been well observed, that, from the benevolence of the Deity, we might, *à priori*, have drawn the same conclusion. We find insects liable to such an infinite number of accidents, and perishing by such slow degrees in what we should call torture, that we are driven to conclude that it is a mistake to call it torture. I have seen a beetle, a *Scarabæus* I think, in the possession of a person in London, which he found entirely eaten up, all but the upper hard shell, by the mites which invariably infest such beetles. It lived six days after he met with it. I once found a moth, *Callimorpha miniata*, impaled alive on a thorn, which had pierced its body: it was quiet, and when I lifted it off the thorn it flew away.[c] Every one who is in the habit of observing what lies in his way, must occasionally have met with beetles in the foot-path, half crushed, and glued

[c] How could it have got into such a situation if it had felt pain as the thorn was entering its body? Could we ever expect to find a wild beast in a similar situation?

to the ground by their own entrails, yet alive, and likely to linger long in that state. Can we believe that they would be endued with such vitality if their sensibility were not diminished in proportion? To shew how fitting it is that we should make the right inference in such a case with regard to the Divine benevolence, I may be permitted to mention that I had a friend, who, by making the wrong one, actually became, for a time, an avowed sceptic. It was strange to me that he should allow his uncertainty with respect to the feelings of insects to be set in comparison with, and even to supersede, his certainty with respect to the goodness of the Deity; but the fact proves how compelled a reflecting person must be to adopt one or other alternative. I might, in order to strengthen my argument, refer to the apparently cruel economy of the flies which belong to the *Ichneumonidæ* and other innumerable Hymenopterous families, and Dipterous ones too, which deposit their eggs in the caterpillars of moths.[d] How often do we find such a caterpillar (and it is not confined to such only), which lives not for itself, but solely for its voracious tenants, which devour its substance, sparing only its vitals for a last meal when it shall have come to complete maturity and ceased to eat. Nay, according to Mr. Newman's recent observations,[e] these tenants may themselves, at the

[d] Paley (in his Natural Theology, I believe) observes, with respect to the destruction of cattle for our food, that, if it does not shock us that they should die at all, if we do not go the length of demanding immortality for them, it should be pleasing to our feelings that they die as they do, in the speediest manner, in full possession of health, after living an agreeable life, during which they were plentifully provided with the best sustenance; the alternative being, if there were any alternative (for in general they are produced, as well as supported, for the purpose of yielding us food), that they would pass a half-starved existence, and endure a lingering termination to it by disease or hunger. Similar reasoning will apply to the breeding of insects with a view to the cabinet—they are gainers by it. The larvæ or caterpillars, which are in that stage of the quadripartite existence of insects, which is in some cases the only eating stage, and in all cases the principal one, are enabled to feed day and night in captivity, whilst in the open air the majority of them feed only in the night; and they are protected from their indefatigable pursuers, the ichneumons, which would deposit their eggs in them, and (on the supposition of their feeling, which I am only granting for the sake of argument) would render their life a burthen to them, and terminate it even at an earlier stage than the entomologist would.

[e] This remarkable discovery was published in Mr. Loudon's *Magazine of Natural History*, No. XXV. p. 252. Our readers will find it well worth perusal.—Ed.

very same moment, be tenanted by devourers of another tribe; so that family within family may be living beneath the skin of the caterpillar, who, if he be a sufferer, is a very patient one, exhibiting no disposition to pine, or to forego one day of the existence which nature originally destined him to enjoy. But I need say no more on this point. The study of insects formed, we have no reason to doubt, a part of the wisdom of Solomon, without incapacitating him for higher wisdom; and the pious father of Solomon addresses the Almighty in words of inspired truth, "Thy *mercy* is over *all* thy works."

There is a popular quotation which it is worth while to notice, which brings the authority of Shakspeare to bear on the question in dispute. We are triumphantly reminded that he tells us

> "— the poor beetle that we tread upon,
> In corporal suffrance finds a pang as great
> As when a giant díes."

But not to say that even Shakspeare is not an oracle on all points, it is somewhat amusing that his words should, in this case, be entirely wrested from their original purpose. His purpose was to shew how little a man feels in dying;—that "the sense of death is most in apprehension, not in the act; and that even a beetle, which feels so little, feels as much as a giant does." The less, therefore, the beetle is supposed to feel, the more force we give to the sentiment of Shakspeare.

I might, before I conclude, advert to the argument we sometimes hear, of the want of Scriptural sanction for killing insects with a view to a collection. This argument must come with a bad grace from those who allow themselves to kill them, with a view merely to the removal of a personal or domestic annoyance. The exhibition of a large and most beautiful department of the creation is surely a higher object than this; and such an exhibition can be made in no other way than by means of a collection. When all scruples have vanished at the bidding of our own convenience or comfort, it is too late to be fastidious only when God's glory is concerned. Even if it be but for scientific purposes that the collection is made, I know not how a person can consistently reproach the Entomologist, as long as he is conscious that he has not forbidden his gardener to destroy the slugs that partake of his cabbages, or the blight insects,—the *Aphides*,—that impair the

luxuriance of his roses. As to the quotation from Scripture which I have heard,—"We must not do evil that good may come,"—it can only be from want of reflection that it can be applied to the present case. Is it, *in itself*, an evil to kill an insect?

But I must not go on. I have already trespassed on the attention of my audience, and must beg pardon of those to whom I have communicated nothing new. I will only say, in conclusion, that as there must always remain some doubt with respect to the feelings of insects, it is right that they should have the benefit of the doubt. Their life should not be wantonly taken from them,—it is the only one they have. I have never tried any experiments at their expense; what I have observed has occurred when I was killing them for the cabinet. The speediest mode of putting them to death should always be resorted to; and it yet remains to confer a great obligation on Entomologists by discovering a mode which, without injury to their colours, shall be instantaneous.

ADDENDUM.—The remarkable vitality of insects might have been adduced, not only as a proof of their want of sensibility, but as a point of resemblance between them and plants. It is said that flies which have been bottled in wine, and have remained in the bottles several years, have come to life again on being released and exposed to the sun. There are some interesting facts mentioned in the *Quarterly Review*, in an article on Dwight's Travels in America, which bear upon this analogy between insects and plants. It may, indeed, be asked, without irreverence, what became of the insects in the deluge? It is not said that any thing but beasts, fowls, and reptiles were taken into the ark. Insects seem to have been left on the same footing with plants,—some individuals of each kind being likely to recover after the immersion.

Art. XV.—*Monographia Chalcidum.* By Francis Walker, Esq. F.L.S.

(Continued from page 29.)

Family II.—Torymidæ.

Caput transversum: oculi laterales: ocelli in triangulum dispositi: antennæ 13-articulatæ, plus minusve clavatæ: mandibulæ tridentatæ, aut una tridentata altera bidentata: maxillæ elongatæ, externè hirsutæ, internè ciliatæ: mentum plus minusve elongatum: labium elongatum, fissum: palpi maxillares articulis 4, ultimo elongato, subfusiformi: palpi labiales articulis 3, secundo brevi: thorax gibbus aut convexus: prothoracis scutellum plerumque antice angustatum: mesothoracis scutum magnum, suturis duabus lateralibus inter parapsides et scutum proprium benè determinatis, scutellum ovatum; paraptera triangula: metathoracis præscutum angustum; scutellum magnum, canaliculatum: abdomen[a] convexum aut gibboso-compressum: oviductus plerumque exsertus: coxæ magnæ: femora clavata aut subclavata: tibiæ apice spinis duabus armatæ: tarsi articulo 1mo longo, sequentibus longitudine decrescentibus, ultimo longiore, crasso: ungues arcuatæ pulvilli distincti: alæ anticæ nervus solitus ramulum stigmaticalem emittens perbrevem, apice furcatum.[b]

It may be observed that this family resembles the preceding in the developement of the thoracic segments, the abdomen, &c.; though the trophi are very differently formed, and the mandibles armed with much longer and sharper teeth: the stigmal branch is very short, curved: the apex furcate, the upper division pointing toward the extremity of the costal nervure, the lower terminated by the stigma: in some of the smaller species the furcation is indistinct.

The Eurytomidæ, and most of the pentamerous Chalcides, have very little variation in the shape of the stigmal branch;

[a] According to MacLeay there are nine primary abdominal segments, some of which, owing to the great developement of others, are almost evanescent. Of this fact the Chalcides offer a good illustration; where the shape of the abdomen, owing to the difference in the size and form of the segments, is almost infinitely varied; and the disposition of the ventral segments differs occasionally in the same species. As a complete description of the abdomen in each species of this tribe would alone fill a volume, and is more appropriate to their anatomy, I have omitted it here; trusting that the descriptions given will enable entomologists to recognize my genera and species.

[b] Forma ad hanc familiam, Leucospidem, Chalcidem et cognatos propria.

but the formation here described is peculiar to this family, and to Leucospis, Thoracanthus, Smiera, Dirhinus, Chirocera, Chalcis, Haltichella, and their affinities. These genera are distinguished by their gibbous bodies, large coxæ, and incrassated posterior thighs. The species are chiefly extra-European, and among their number are some of the largest in the whole tribe. Their natural situation I imagine to be immediately following this family; but having few genera or species, I shall leave them for examination to some future opportunity.

Characteres Generum.

- Mesoscutellum
  - convexum proscutellum
    - elongatum . . . . . 1. MEGASTIGMUS.
    - breve. Pedes
      - femoribus posticis incrassatis dentatis, tibiis posticis arcuatis . . . . . 2. PRIOMERUS.
      - femoribus posticis clavatis serratis, tibiis posticis rectis . 3. TORYMUS.
  - gibbum. *Antennæ* articuto 4to.
    - subæquales . . . 4. CALLIMOME.
    - brevi . . . . . 5. ORMYRUS.
    - elongato . . . . 6. PERILAMPUS.

Dalman divides his genus Torymus (named Callimome long before by Spinola) into three sections, the second one subdivided, viz.

A. (Megastigmus.) *Stigma incrassatum magisque determinatum: collare majusculum: corporis color non metallicus.*

B. (Torymus propr.) *Stigma parvum abbreviatum; corpore metallicolor.*

(a.) *Femoribus posticis dentatis.*

(b.) *Femoribus omnibus muticis.*

C. (Anomali.) *Corpore breviore, abdomine gibbosiore, oviductu non exserto.*

I have reserved his name, Torymus, for the first division of his second section; the other division is Callimome, *Spinola*. It is not unlikely that his third section is allied to Ormyrus, *Westwood*.

GENUS I. MEGASTIGMUS, *Dalman*.

Caput medium: palpi maxillares articulis 1, 2 et 3 subæqualibus: mentum ovatum, anticè acuminatum, posticè subquadratum:

mandibulæ arcuatæ, tridentatæ: antennæ subclavatæ, pilosæ, articulo 1°. elongato, 2°. brevicyathiformi, 3°. brevissimo, 4°. et sequentibus ad 10um. latioribus longitudine decrescentibus, tribus ultimis approximatis: pedes subæquales: thorax convexus: proscutellum elongatum, anticè angustatum aut ferè subquadratum: mesoscutellum convexum: abdomen elongatum, convexum, *maris* petiolatum, *feminæ* sessile: oviductus exsertus.

Sp. 1. Meg. transversus. Fem. ***Fulvus nigro variegatus, oviductu corpore longiore, alis hyalinis.***

Caput posticè et inter oculos nigrum: oculi ocellique rufo-fusci: prothorax posticè flavus: mesoscutum anticè et paraptera nigro-fusca: metathorax ater: abdomen basi nigro maculatum, fasciis 5 connectis abbreviatis fuscis; segmentorum margines postici flavi: antennæ nigræ, scapus subtus flavus: pedes flavi: coxæ nigræ: tarsi apice fusci: nervus subcostalis fuscus: stigma magnum, nigrum. (Alarum longitudo, $2\frac{1}{2}$—3 lin.)

July; on grass in woods; near London.

Sp. 2. Meg. dorsalis. Mas. et Fem. ***Viridis flavo variegatus, abdomine æneo, oviductu corpore breviore, alis subhyalinis.***

Ichneumon dorsalis.	*Fabr. Ent. Syst. Suppl.* 231. 218.
Coqueb.	*Illust. Icon.* I. Tab. 5. Fig. 3.
Diplolepis dorsalis.	*Fabr. Syst. Piezat.* 151. 11.
Cinips dorsalis. .	*Fonscolombe, Ann. Sci. Nat.* 26. 282.

Mas. Caput anticè flavum: oculi flavo cincti ocellique rufi: antennæ fuscæ: scapus viridis, basi subtusque flavus: coxæ posticæ nigro-fuscæ: femora postica externè viridi-æneo maculata, basi rufo-cincta: pedes straminei: tarsi apice fusci: nervus subcostalis fuscus; stigma nigro-fuscum, magnum.

Fem. Caput flavum, inter oculos viride: abdomen flavum, disco-fusco-æneo: pedes straminei: tarsi apice fusci. (Alarum longitudo, $1\frac{2}{3}$—3 lin.)

Var. β.—*Mas.* Pedes omninò flavi.

Var. γ.—*Mas.* Antennæ articulo secundo æneo-fusco.

Var. δ.—*Fem.* Thorax viridis, anticè et lateraliter flavus: paraptera basi nigra: antennæ nigro-fuscæ, apice basique fuscæ: stigma posticè in alarum discum productum.

Var. ε.—*Fem.* Flavus: caput inter ocellos thoracisque linea virides.

June and July; on oak trees; near London. September; Isle of Wight.

Genus II. Priomerus,[c] *Walker.*

Caput medium: thorax convexus: abdomen subpetiolatum: oviductus exsertus: antennæ clava articulis precedentibus multo latiore: femora coxæque posticæ elongatæ, incrassatæ; illa subtus dentata: tibiæ posticæ arcuatæ.

Sp. 1. Priom. pachymerus. Fem. *Nigro-viridis, abdomine æneo-viridi, oviductu corpore dimidio longiore, antennis fuscis, pedibus rufis, alis subhyalinis.*

Oculi ocellique rufi: antennarum clava nigra, scapus rufus: abdomen subtus rufum: coxæ nigro-virides. (Alarum longitudo, $1\frac{3}{4}$ lin.)

The disc of the thorax is dark green, the margins brighter. July; South of France.

Genus III. Torymus, *Dalman.*

Caput medium: thorax convexus: proscutellum breve: abdomen sessile: oviductus exsertus: clava articulis duobus præcedentibus multo brevior, acuminata: femora postica subtus clavata, serrata apice abruptè graciliora.

The sutures of the mesoscutum are indistinct: the posterior thighs are dilated beneath, the dilatation increasing in breadth from the base to near the apex, where it terminates at a right angle: the stigmal branch is longer than in Callimome, and forms a more acute angle with the continuation of the subcostal nervure.

Sp. 1. Tor. caliginosus. Fem. *Nigro-purpureus, thorace nigro-æneo, oviductu abdomine longiore, tarsis stramineis, alis fuscis.*

Abdomen basi viride: antennæ nigræ, scapus viridis: tarsi apice fusci: alæ basi hyalinæ, anticæ versus medium obscuriores. (Alarum longitudo, 2 lin.)

July; South of France.

Genus IV. Callimome, *Spinola.*

Ichneumon. *Linn. Deg. Fabr. Scop. Schr. Vill. Ross. Walck.*

Cynips. . . *Geoff. Schæff. Schr. Fabr. Oliv. Walck. Lat. Christ. Leach, Samouelle, Fonscolombe.*

[c] Πριων serra, μηρος femur.

Diplolepis . *Fabr. Walck. Illig. Spin.*
Cleptes . . *Fabr.*
Chalcis . . *Cuvier, Lam. Jurine.*
Misocampus *Latr.*
Torymus . *Dalman, &c.*

A Megastigmo, proscutello brevi *maris*que abdomine sessili, differt: antennæ plus minusve clavatæ: thorax convexus aut gibbus: oviductus exsertus aut subexsertus.

The species of this genus deposit their eggs in the larvæ of the gall-insects, (Cynips, *Linn.*), for which purpose their long ovipositors are well adapted. Réaumur, Degeer, Olivier, Latreille, and Spinola, have published many interesting observations on their economy and structure. The basal abdominal segment is long, and, lapping over the second, extends to the base of the third joint: its extremity is not connected with the abdomen.

Obs. Where the colour of the antennæ is not mentioned, it is invariably black.

Sp. 1. Callim. regalis. Mas. *Purpureo-cyaneus, abdomine æneo, antennis nigris, pedibus rufis, alis subfuscis.*

Caput cyaneum, inter oculos utrinque viride: oculi fusci: ocelli pallidi: thorax purpureo-cyaneus, punctatus, rufo-hirtus: abdomen nitidum, glabrum, æneum, basi aureo-viride: antennæ nigræ: pedes rufi: tarsi pallidi, articulis 4 et 5 fuscis: alæ fuscæ, basi hyalinæ, anticæ fusco interruptè fasciatæ. (Alarum longitudo, $3\frac{1}{2}$ lin.)

The colour of the head and thorax is deep blue, slightly tinged with purple: the first abdominal segment is golden green, changing to æneous toward its posterior margin: the second and third segments are cupreous: the abdomen beneath, and the paraptera of the mesothorax are green: the anterior part of the superior wings is nearly hyaline, with a large fuscous spot in the centre.

July; on plants in a wood; near London.

Sp. 2. Callim. cynipedis. Fem. *Purpureus, abdomine cupreo, basi fulvo, pedibus rufis, alis subfuscis.*

Ichneumon cynipedis *Linn. Syst. Nat.* II. 939. 68. *Fn. Suec.* 1639. *Fabr. Ent. Syst.* 2. 187. 223.
Diplolepis cynipedis. *Fabr. Syst. Piezat.* 152. 17.

Oculi fusci: ocelli pallidi: thorax purpureus, anticè æneo-viridis, posticè viridi-nitens: oviductus corpore dimidio longior: antennarum articulus primus flavus, apice niger: pedes pallidè rufi: tarsi straminei, apice obscuriores: alæ anticæ fusco longitudinaliter maculatæ. (Alarum longitudo, $3\frac{3}{4}$ lin.)

Prothorax æneous green: mesothorax purple, æneous green when viewed horizontally; margins of the segments, and a spot near the apex of the scutellum, green: metathorax and coxæ of posterior legs bright green: abdomen dark cupreous, the two basal segments fulvous: legs pale red: two basal joints of the tarsi straw-coloured: the superior wings have a fuscous spot extending almost from their base to the stigmal branch.

July; in a meadow; near London.

Sp. 3. Callim. Roboris. Mas et fem. *Cyaneus, capite viridi, abdomine æneo basi flavo, pedibus rufis, alis hyalinis* (mas) *aut subfuscis* (fem.)

Caput viride: thorax cyaneus aut purpureo cyaneus: *maris* abdomen æneum aut viridi-æneum, basi flavo cingulatum; *feminæ* rufum, basi supra viride, apice æneo cupreo viridi nigroque variegatum: scapus rufus, *maris* supra viridis: oviductus corpore paullo brevior: pedes rufi: tarsi flavi, articulis duobus ultimis pallidè fuscis. (Alarum longitudo, $1\frac{3}{4}$—$3\frac{1}{2}$ lin.)

Var. β.—*Mas.* Abdomen supra viridi-æneum, immaculatum.

Var. γ.—*Fem.* Thoracis latera viridi variegata.

This species is very abundant on the foliage of oak trees, and amongst the grass beneath, near London, from June to September. It varies considerably in size; the male is usually much smaller than the female. It resembles Cinips ventralis, *Fonscolombe.*

Sp. 4. Callim. quadricolor. Fem. *Viridis, abdomine cupreo basi rufo, pedibus rufis, alis hyalinis, anticis fusco maculatis.*

Caput cyaneo-viride: oculi ocellique rufi: thorax viridis, nitens: abdomen cupreum, basi rufum, apice viride: oviductus abdomen longitudine æquans: scapus et pedes rufi. (Alarum longitudo, $1\frac{1}{2}$—$2\frac{1}{2}$ lin.)

It has thick legs and antennæ, and runs much faster than most species of this genus: the base of the first abdominal

segment is green above: the tips of the posterior thighs, in some specimens, are slightly fuscous: the wings are narrow, the superior have a large fuscous spot occupying more than half their breadth, and extending from a little beyond the stigmal branch nearly to their base.

June; in a meadow; near London. September; on ferns; in the vicinity of Ambleside, Westmoreland.

Sp. 5. Callim. Geranii. *Curtis.* Fem. *Viridis, abdomine flavo cingulato, pedibus flavis, alis hyalinis.*

Abdomen viridi-æneum, flavo cingulatum, basi viride, apicis lateribus æneis aut nigris: oviductus corpus longitudine æquans: scapus et pedes flavi: genua tarsique straminei, horum apices fusci: femora antica apice pallidè virescentia. (Alarum longitudo, $3-3\frac{1}{2}$ lin.)

Var. β. — Caput viridi-æneum: scapus supra niger: abdomen apicem versus viride.

The wings of this species are much longer and broader than those of C. Roboris, or quadricolor.

September; near the sea-shore; Isle of Wight.

Sp. 6. Callim. pretiosus. Mas. *Cyaneo-viridis, abdomine cupreo basi flavo, pedibus rufis, alis hyalinis.*

Oculi ocellique rufo-fusci: abdomen apice viridi-æneum, segmentum primum flavum basi cyaneum: femora postica virentia: tarsi flavi, apice fusci. (Alarum longitudo, $1\frac{3}{4}$ lin.)

Reared with C. Bedeguaris, by Mr. Curtis, from the galls of the dog-rose.

Sp. 7. Callim. Bedeguaris. Mas et Fem. *Viridis, abdomine cupreo aut æneo, oviductu corpore paullò breviore, pedibus pallidè rufis, alis subfuscis.*

Ichneumon Bedeguaris.	*Linn. Syst. Nat.* II. 993. 63. *Fn. Su.* 1634. *Fabr. Ent. Syst.* II. 185. 215. *Geoff. Ins.* II. 296. 1. *Roes. Ins.* III. Tab. 53. Fig. F. A. *Aut. Nat. Cur. Dec.* II. *Ann.* II. *Obs.* 10. *Réaum. Ins.* III. Tab. 41. Fig. 13, 14. &c. &c.
Diplolepis Bedeguaris.	*Fabr. Syst. Piezat.* 150. 6.
Callimome . . .	*Spinola.*

Misocampus . .	*Latr.*
Pteromalus . .	*Swed. Stock. Trans.* 1795.
Torymus . .	*Dalman.*
Cinips . . .	*Oliv. Enc. Méth. Fonscolombe. Ann. Sci. Nat.* 26. 283.

Mas.—Æneo-viridis: oculi ocellique rufi: thorax apice viridis: abdomen æneum, basi viride: scapus totus niger: genua tarsique straminei, horum apices fusci.

Fem.—Viridis: caput inter oculos æneum: thorax apice subtusque æneus, segmentorum margines concolores: abdomen cupreum, basi viride: scapus basi subtusque flavus. (Alarum longitudo, $1\frac{3}{4}$—3 lin.)

It is narrower than C. pretiosus: the wings also are narrower and longer, the nervures darker.

This insect, and several other species, are parasites of the larvæ which inhabit the galls of the dog-rose. Mr. Curtis has reared it from the galls during the months of July, August, and beginning of September. Mr. Wailes has taken it in the North of England.

Sp. 8. Callim. varians. Fem. *Viridis, nitens, abdomine apice æneo, oviductu corpore paullo longiore, pedibus flavis, femoribus supra viridibus aut æneis, alis subfuscis.*

Oculi ocellique rufi: thorax posticè subtusque viridi-æneus: abdominis segmentum primum viride, cupreo notatum: scapus flavus: genua tarsique straminei. (Alarum longitudo, $1\frac{3}{4}$—$2\frac{1}{4}$ lin.)

Var. β.—Scapus fuscus, basi subtusque flavus: tibiæ posticæ femoraque 4 antica fusco maculatæ.

The basal joint of the antennæ above has sometimes a fuscous line near the apex, extending occasionally almost to the base: the thorax beneath, the margin of its segments above, and the whole metathorax, are æneous: the basal abdominal segment has several small cupreous spots on its disc: the thighs have a green or æneous spot above, larger and brighter in the posterior pair.

August; in meadows; near London.

Sp. 9. Callim. formosus. Fem. *Cupreus, nitens, oviductu corporis dimidio longiore, pedibus flavis, alis subfuscis.*

Caput cupreo-æneum, anticè viride: oculi ocellique rufo-fusci: thorax anticè posticèque viridi-æneus: abdominis segmentum

primum versicolor, cupreo æneo viridique micans: scapus flavus, apice æneo-fuscus: femora fulva, postica fusca: alæ anticæ ramulum prope stigmaticalem fuscescentes. (Alarum longitudo, $3\frac{1}{2}$ lin.)

The paraptera of the mesothorax are green: the basal abdominal segment, and the posterior coxæ, have a brilliant gold colour, changing to cupreous or green, according to the direction in which they are viewed: the posterior thighs have a cupreous or æneous tinge: the inferior wings are almost colourless.

July; on grass, beneath an oak tree; near London.

Sp. 10. Callim. scutellaris. Fem. *Viridis, cupreo micans, scutello cupreo, abdomine cupreo-æneo, oviductu corpore vix breviore, pedibus stramineis, femoribus posticis fuscis, alis subhyalinis.*

Thorax posticè abdominisque segmentum basale viridi micantes: scapus flavus: tibiæ posticæ femoraque 4 antica fulvæ: alæ superiores anticè subfuscæ. (Alarum longitudo, 3 lin.)

The head and thorax, being seen in different directions, vary in colour from green to cupreous, occasioned probably by the punctures having cupreous bases, while their sides and edges are green: the metathorax is golden green, as likewise is the abdomen, excepting the first segment and the anterior part of the second, which are green: it has more slender antennæ than the preceding species.

August; on grass, beneath trees; near London.

Sp. 11. Callim. Hederæ. Fem. *Cupreo-æneus, oviductu abdomine paullò longiore, pedibus pallidè rufis, alis anticis pallidè flavescentibus.*

Oculi ocellique fusco-rufi: abdominis segmentum primum supra: thorax anticè posticèque virides: scapus flavus, apice fuscus: tarsi 4 postici pallidè flavi: alæ hyalinæ, superiores marginem versus anticum pallidè flavescentes. (Alarum longitudo, $2\frac{1}{2}$—$2\frac{3}{4}$ lin.)

The body is small: the head and thorax vary in colour from cupreous to green, like the preceding species: the first, and sometimes the second abdominal segment is green above: the antennæ are rather slender: the wings broad.

October; on the flowers of the ivy; near London.

Sp. 12. Callim. Arundinis. *Curtis.* Fem. *Æneo-viridis, oviductu corpore vix longiore, pedibus rufis, alis anticis subfuscis.*

Caput æneum: oculi ocellique rufi: abdomen basi viride: tarsi 4 postici straminei, apice rufi: alæ elongatæ, angustæ. (Alarum longitudo, $2\frac{1}{4}$ lin.)

Narrow, bright æneous green: legs slender: two basal joints of four posterior tarsi pale straw colour: wings slightly fuscous.

September; near the shore; Isle of Wight.

Sp. 13. Callim. macropterus. Fem. *Viridis, abdomine æneo, oviductu corpore vix breviore, pedibus flavis, alis subfuscis, quàm in C. Bedeg. latioribus.*

Caput posticè viridi-æneum: oculi ocellique rufi: thorax lateraliter posticèque æneus: abdomen basi viride: scapus viridis, subtus flavus: tarsi 4 postici basi genuaque straminei: alæ latæ. (Alarum longitudo, $2\frac{3}{4}$ lin.)

Bright green: abdomen bright æneous, changing to bright green toward the base: wings long and broad.

August; on grass beneath trees; near London.

Sp. 14. Callim. flavipes. Mas et fem. *Æneo-viridis, oviductu abdomine paullò longiore, pedibus flavis, alis subhyalinis.*

Oculi ocellique rufi: *maris* abdomen viride, basi apiceque æneum: *feminæ*, scapus flavus, apice fuscus: tarsi 4 postici genuaque straminei. (Alarum longitudo, $1\frac{3}{4}$—$2\frac{1}{4}$ lin.)

Var. β.—*Fem.* abdomen basi æneum.

Var. γ—*Mas*, femora postica viridi, tibiæ posticæ fusco, maculatæ.

Apical joints of tarsi fuscous: wings much paler and rather narrower than those of the preceding species.

May and June; oak trees; near London. September; Isle of Wight. July; Forest of Fontainebleau.

Sp. 15. Callim. Dauci. *Curtis.* Fem. *Viridis, nitens, oviductu abdomen longitudine æquante, pedibus flavis, alis hyalinis.*

Cynips. auratus. *Fourc. Oliv. &c.?*

Oculi ocellique rufi: antennarum scapus flavus apice fuscus, articulus secundus fusco-æneus: genua tarsique 4 postici straminei, horum apices fusci. (Alarum longitudo, $1\frac{3}{4}$—2 lin.)

It resembles the preceding species, but the colour is entirely brilliant green: the body is narrower and longer: the wings are quite hyaline, their nervures paler.

May and June; on oak trees; near London.

During the month of August, Mr. Curtis found, on the Daucus Carota, near Niton in the Isle of Wight, some galls containing bright orange-coloured larvæ. They produced this insect at the beginning of September.

Sp. 16. Callim. basalis. Fem. *Æneo-viridis, nitens, abdomine viridi basi æneo, oviductu abdomen longitudine æquante, pedibus flavis, alis subfuscis.*

Oculi ocellique rufi: scapus fuscus, subtus flavus: genua tarsique straminei: tarsi 4 postici apice fusci. (Alarum longitudo, 2 lin.)

Body shorter: wings darker than of C. flavipes or Dauci: abdomen bright green: base of the first segment bright æneous.

July, August; in fields; near London.

Sp. 17. Callim. confinis. Fem. *Viridis, nitens, oviductu abdomen longitudine æquante, pedibus pallidè rufis, tibiis posticis fusco-maculatis, alis hyalinis.*

Oculi ocellique rufi: scapus viridis, subtus flavus: tarsi apice fusci, 4 postici genuaque straminei: nervus subcostalis flavus. (Alarum longitudo, $1\frac{1}{2}$—$1\frac{3}{4}$ lin.)

Var. β.—scapus flavus.

Var. γ.—thorax æneo-viridis, posticè viridis.

The antennæ are shorter and more clavate than those of C. flavipes, Dauci, or basalis; there is sometimes a fuscous spot on each of the posterior tibiæ.

August; in fields; near London. September; Isle of Wight.

Sp. 18. Callim. autumnalis. Fem. *Viridis, nitens, abdomine æneo basi viridi, oviductu abdomine paullò longiore, pedibus flavis, alis hyalinis.*

Oculi ocellique rufi: thorax posticè viridi-æneus: scapus flavus, apice niger: genua tarsique straminei, horum apices fusci: femora tibiæque posticæ nonnunquam subtus fuscæ: nervus subcostalis stigmaque pallidi. (Alarum longitudo, $1\frac{3}{4}$ lin.)

It is smaller and narrower, and has narrower wings than C. flavipes, Dauci, or basalis: the antennæ are more slender and less clavate than those of C. confinis: the subcostal nervure and stigma are pale fuscous, the latter small.

September; Isle of Wight.

Sp. 19. Callim. nitens. Fem. *Viridis, nitens, abdominis disco æneo, oviductu vix exserto, pedibus stramineis, femoribus posticis supra viridi maculatis, alis subfuscis.*

Oculi ocellique rufi: abdominis linea dorsalis abbreviata ænea: scapus flavus, supra viridis: articulus secundus æneo-fuscus. (Alarum longitudo, $2\frac{1}{3}$ lin.)

The base of the abdomen beneath, and its second and third segments above, are æneous: the apical joints of the four posterior tarsi are yellow: the claws slightly fuscous: the wings long and broad.

July; near London.

Sp. 20. Callim. brevicauda. Fem. *Viridis, nitens, præcedenti angustior, abdominis disco æneo, oviductu subexserto, pedibus pallidè rufis, femoribus viridi-æneis, tibiis posticis fuscis, alis subfuscis.*

Oculi ocellique rufi: thoracis abdominisque latera viridi-ænea: scapus, genua tarsique flavi, postici straminei. (Alarum longitudo, $2\frac{1}{4}$ lin.)

The abdomen has an æneous line above, extending from the second segment to the apex: the alary nervures are pale: the stigma very small.

September; Isle of Wight.

Sp. 21. Callim. abdominalis. Fem. *Viridis, nitens, abdominis basi æneo-cyaneo purpureoque micante, oviductu vix exserto, pedibus flavis, femoribus viridibus, tibiis posticis fuscis, alis hyalinis.*

Oculi ocellique rufi: abdominis segmentorum margines viridi-ænei: scapus viridis, subtus flavus: tarsi 4 postici genuaque straminei, illorum apices fusci. (Alarum longitudo, $2\frac{1}{4}$ lin.)

It is more slender, and has much narrower wings than the preceding species: the margins of the different thoracic parts are æneous green: the first abdominal segment has its base

æneous, changing to æneous green, green, blue; the apex is purple; the other segments are green, their bases æneous: the stigma is very small.

September; Isle of Wight.

Sp. 22. Callim. mutabilis. Mas et fem. *Viridis, nitens, abdomine æneo-viridi, oviductu abdomen longitudine æquante, pedibus flavis, femoribus viridibus, alis hyalinis.*

Oculi ocellique rufi: thorax posticè æneo-viridis: *maris* abdomen æneum, basi apiceque viride: *feminæ* viride, anticè cyaneo-viride, lateraliter viridi-æneum: scapus viridis, *feminæ* basi subtusque flavus: coxæ virides: trochanteres flavi: tibiæ posticæ fusco cingulatæ: genua tarsique straminei, 4 postici apice fusci. (Alarum longitudo, $1\frac{1}{4}$—2 lin.)

Var. β.—*Mas*, scapus basi flavus: abdomen apice æneum: tibiæ posticæ femoraque fuscæ: tibiæ intermediæ supra pallidè fuscæ.

Var. γ.—*Fem.* abdomen æneo-viride, basi viride: femora 4 antica flava, supra virentia.

Var. δ.—*Fem.* omnino viridis: pedes flavi: femora tibiæque posticæ pallidè fuscæ.

This species varies considerably in size and colour: the prothorax of the male has a bluish, the metathorax an æneous tinge: the abdomen of the female is green, or æneous green, the base sometimes bluish green: the tips of the four anterior thighs are yellow.

July; on grass beneath trees; near London. September; Isle of Wight.

Sp. 23. Callim. microstigma. Fem. *Viridis, nitens, oviductu abdomine paullò longiore, pedibus flavis, femoribus viridibus, tibiis posticis nigro-fusco cingulatis, alis hyalinis.*

Oculi ocellique rufi: abdomen aureo viride, basi æneum: scapus niger, subtus flavus: trochanteres flavi: genua tarsique straminei, 4 postici apice fusci: nervus subcostalis pallidus: stigma minimum. (Alarum longitudo, 2—$2\frac{1}{4}$ lin.)

Var. β.—abdomen viride: apice æneo-viride: scapus basi flavus: femora 4 antica flava, supra virentia.

Bright green: anterior part of the thorax darker: tips of the four posterior tarsi dark fuscous: it has broader wings and a paler stigma than the preceding species.

August; on grass in woods; near London.

Sp. 24. Callim. chloromerus. Mas et fem. *Viridis, nitens, oviductu corpore vix breviore, pedibus flavis, femoribus viridibus, tibiis posticis fusco cingulatis, alis hyalinis.*

Oculi ocellique rufi: *maris* abdomen æneum, basi viride: *feminæ* scapus viridis, basi flavus: trochanteres, et femora 4 antica basi apiceque, flavi: genua et tarsi straminei, *feminæ* antici apice flavi: nervus subcostalis pallidus: stigma minimum. (Alarum longitudo $1\frac{1}{2}$—2 lin.)

Var. β.—*Mas*, femora 4 antica subtus flava.

Var. γ.—*Fem.* abdominis segmentum primum cyaneo micans.

Var. δ.—*Fem.* thoracis dorsum lateraque viridi-ænea.

The male has the mesoparaptera æneous green: the two basal, and the sides of the two following abdominal segments, green: the apical segment æneous green: the female is entirely bright green: this species is narrower than either of the two preceding, and may also be distinguished from C. mutabilis by its smaller and paler stigma.

September; Isle of Wight. On the banks of Windermere, in Westmoreland.

Sp. 25. Callim. latus. Mas et fem. *Viridis, nitens, oviductu abdomen longitudine æquante, pedibus flavis, femoribus viridi-fuscis, alis subfuscis.*

Oculi ocellique rufi: *maris* abdomen æneum, basi viride: scapus viridis aut fuscus, basi subtusque flavus: trochanteres flavi: genua tarsique straminei, postici apice fusci: *feminæ* femora viridi, tibiæ posticæ fusco cingulatæ: nervus subcostalis pallidus: stigma minimum. (Alarum longitudo, $1\frac{1}{3}$ lin.)

The metathorax of the male is darker and less punctured than the pro or mesothorax: the body is short and broad: the posterior tibiæ are fuscous, their tips yellow: the wings are rather short.

July; near London. September; Isle of Wight. North of England; Mr. Wailes.

Sp. 26. Callim. microcerus. Mas. *Viridis, nitens, abdomine æneo, antennis fuscis, basi nigris, pedibus flavis, femoribus posticis viridi-fuscis, alis hyalinis.*

Oculi ocellique rufi: thorax posticè et lateraliter viridi-æneus: abdomen basi viride: scapus et articuli tres sequentes nigri, ille subtus

flavus: tibiæ posticæ fusco cingulatæ: genua tarsique straminei, horum apices fusci: nervus subcostalis pallidus: stigma minimum. (Alarum longitudo, $1\frac{1}{3}$ lin.)

Head slightly æneous: prothorax dark green: mesothorax bright green: first and second abdominal segments green: antennæ short and slender: subcostal nervure pale fuscous, yellow towards its base.

July; near Clermont, in Auvergne.

Sp. 27. Callim. æqualis. Fem. *Viridis, abdomine viridi-æneo, oviductu dimidio abdomine longiore, pedibus flavis, tibiis posticis femoribusque fuscis, alis hyalinis.*

Oculi ocellique rufi: thorax posticè æneo-viridis: abdomen basi viride: scapus fuscus, basi subtusque flavus: femora postica supra virentia: genua tarsique 4 postici straminei, horum articuli duo ultimi fusci: nervus subcostalis pallidè fuscus: stigma parvum, obscurius. (Alarum longitudo, $1\frac{1}{2}$ lin.)

Tips of thighs and posterior tibiæ yellow: it has narrower, shorter, and rather less hyaline wings than C. chloromerus, mutabilis, or microstigma: from the two latter it may also be distinguished by its more slender body.

June; near London.

Sp. 28. Callim. chlorinus. Fem. *Viridis, nitens, oviductu abdomine breviore, pedibus flavis, femoribus viridibus, tibiis fuscis, alis hyalinis.*

Oculi ocellique rufi: abdominis segmentum primum cyaneo-viride: scapus flavus, apice fuscus: tibiæ fusco maculatæ, posticæ nigro-fuscæ: genua tarsique straminei, horum apices fusci: nervus subcostalis pallidè fuscus: stigma parvum. (Alarum longitudo, $1\frac{1}{3}$ lin.)

Narrower and more linear than the preceding species: tips of thighs and posterior tibiæ yellow: four anterior tibiæ yellow, with a pale fuscous spot near the base.

June; near London.

Sp. 29. Callim. leptocerus. Mas et fem. *Æneo-viridis, nitens, oviductu abdomine longiore, pedibus fulvis, femoribus viridi-fusco, tibiis posticis fusco cingulatis, alis subhyalinis, quàm in C. æquali aut chlorino latioribus.*

Oculi ocellique rufi: mesoparaptera ænea: abdomen viride segmentorum margines viridi-ænei: scapus fuscus, basi subtusque flavus:

genua tarsique straminei, horum apices fusci: nervus subcostalis fulvus: stigma parvum. (Alarum longitudo, $1\frac{1}{3}$—$1\frac{3}{4}$ lin.)

Var. β.—*Fem.* abdomen basi cyaneo-viride.

Var. γ.—*Fem.* abdomen viride, basi æneum.

Var. δ.—*Fem.* abdomen totum viride.

Var. ε.—*Mas*, pedes flavi, immaculati.

Body and wings much broader than those of the two preceding species: antennæ slender.

September; Isle of Wight. North of England. Scotland.

Sp. 30. Callim. micropterus. Fem. *Viridis, abdomine æneo-viridi, oviductu corpore paullò breviore, antennis quàm in C. æquali tenuioribus, pedibus fulvis, femoribus viridibus, tibiis posticis nigro-fuscis, alis hyalinis, quàm in C. chloromero brevioribus.*

Oculi ocellique rufi: abdomen basi viridi nitens: femora tibiæque apice flavæ: genua tarsique straminei, horum apices fusci: nervus subcostalis fulvus: stigma fuscum, parvum. (Alarum longitudo, $1\frac{1}{3}$ lin.)

The head and thorax are dark green; the antennæ short, more slender than of C. æqualis: the trochanters are fulvous: it resembles C. chlorinus in shape, and has narrower wings than C. leptocerus.

July; near London.

Sp. 31. Callim. bicolor. Fem. *Æneo-viridis, C. mutabili angustior oviductu abdomen longitudine æquante, pedibus flavis, tibiis posticis femoribusque fusco cingulatis, alis hyalinis.*

Oculi ocellique rufi: abdominis segmentum primum viride, cupreo variegatum: scapus fuscus, basi subtusque flavus: femora postica supra virentia: genua tarsique straminei, horum apices fusci: nervus subcostalis pallidè fuscus: stigma parvum. (Alarum longitudo, $1\frac{1}{3}$ lin.)

This species is more slender than C. latus, has a shorter and much broader abdomen than C. chlorinus, and may be distinguished from C. leptocerus by its narrower wings.

August; in fields; near London.

Sp. 32. Callim. leucopterus. Fem. *Viridis, nitens, abdomine basi cyaneo micante, oviductu corpore vix breviore, pedibus*

flavis, femoribus viridibus, tibiis posticis fuscis, alis hyalinis, C. chloromeri angustioribus.

Oculi ocellique rufi : scapus viridis, basi flavus : femora 4 antica subtus flava : tarsi apice fusci : nervus subcostalis pallidè flavus stigma parvum, concolor. (Alarum longitudo, $1\frac{1}{2}$ lin.)

The four anterior thighs are sometimes almost fuscous above : it is longer, has more slender antennæ and narrower wings than C. æqualis : the latter character will also distinguish it from C. leptocerus.

September ; Isle of Wight.

Sp. 33. Callim. viridi-æneus. Fem. *Viridis, abdomine viridi-æneo, oviductu abdomine paullò breviore, pedibus fulvis, alis subfuscis.*

Oculi ocellique rufi : caput subtus et thoracis latera ænea : abdominis segmentum primum æneum, apice viride : scapus fuscus, subtus basique flavus : genua tarsique straminei, horum apices fusci : nervus subcostalis pallidè fuscus : stigma parvum, concolor. (Alarum longitudo, $1\frac{1}{2}$ lin.)

The apex of the metathorax is æneous.

September ; Isle of Wight.

Sp. 34. Callim. curtus. Fem. *Viridis, nitens, oviductu abdomen longitudine æquante, antennis quàm in C. Dauci aut confini claratioribus, pedibus flavis, alis hyalinis.*

Oculi ocellique rufi : scapus viridis, basi subtusque flavus : genua tarsique 4 postici straminei, horum apices fusci : nervus subcostalis pallidè fulvus : stigma parvum, concolor. (Alarum longitudo, $1-1\frac{1}{3}$ lin.)

The body and legs are short and thick ; the antennæ more clavate than of most species in the genus : the posterior thighs and tibiæ have sometimes a green or fuscous spot above.

September ; Isle of Wight. Near London.

Sp. 35. Callim. meridionalis. Fem. *Viridis, nitens, thorace cupreo maculato, abdomine æneo, oviductu corpore paullò breviore, pedibus flavis, femoribus æneis, alis subfuscis.*

Caput et thorax posticè viridi-ænei : oculi ocellique rufi : macula dorsalis cuprea : abdominis segmenta posticè virentia, primum cupreo notatum : scapus fuscus, basi subtusque flavus : tibiæ

posticæ apice fuscæ: genua tarsique straminei, horum apices fusci: nervus subcostalis fulvus: stigma parvum, fuscum. (Alarum longitudo, $1\frac{3}{4}$ lin.)

The apex of the scutum, the base of the scutellum, and the paraptera of the mesothorax, are cupreous: the metathorax is æneous: the first abdominal segment is æneous green, speckled with cupreous: the tips of the thighs are yellow.

July; south of France.

Sp. 36. Callim. Euphorbiæ. Fem. *Viridis, pubescens, oviductu corpore paullò breviore, pedibus flavis, femoribus viridibus, tibiis posticis fuscis, alis hyalinis.*

Oculi ocellique rufi: tibiæ posticæ subtus, femora apice basique, flavæ: tarsi straminei. (Alarum longitudo, $1\frac{3}{4}$ lin.)

I am indebted to M. F. Delaporte for this species, taken by him on the spurge in the vicinity of Paris.

Sp. 37. Callim. capreæ. Fem. *Viridis, nitens, oviductu abdominis dimidio paullò longiore, pedibus flavis, femoribus viridibus, tibiis fuscis, alis hyalinis.*

Oculi ocellique rufi. (Alarum longitudo, $1\frac{1}{2}$ lin.)

Taken by M. F. Delaporte on the young shoots of the willow; in the vicinity of Paris.

Sp. 38. Callim. terminalis. Mas et fem. *Viridis aut viridi-æneus, oviductu corpore vix breviore, pedibus flavis, femoribus viridibus, tibiis posticis fuscis, alis hyalinis, nervis quàm in C. chloromero obscurioribus.*

Oculi ocellique rufi: *fem.* caput posticè thoracisque segmentorum margines ænei: abdomen æneum, basi viride: pedes virides: trochanteres, tibiæ 4 anticæ tarsique flavi: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo, 1—$2\frac{1}{4}$ lin.)

Var. β.—*Mas*, thorax totus viridis: pedes flavi: femora postica virentia: tibiæ posticæ femoraque 4 antica fusco cingulatæ.

Var. γ.—*Fem.* caput supra, thoracis apex lateraque cyaneo-virides: abdomen viride aut viridi-æneum, anticè cyaneo-viride: scapus subtus flavus.

Var. δ.—*Fem.* viridis: thorax anticè cyaneo-viridis: caput supra abdominisque segmentum primum cyanea: antennæ articulo secundo viridi: scapus concolor, basi subtusque flavus: femora 4 antica apice flava.

Var. ε.—*Fem.* tibiæ intermediæ subfuscæ.

In some specimens the metathorax is entirely æneous: the knees and tarsi straw-coloured, the apical joints of the latter fuscous.

July; on grass in woods; near London. September; Isle of Wight.

Sp. 39. Callim. inconspectus. Mas. *Viridis, pedibus flavis, femoribus posticis et nonnunquam 4 anticis viridibus, tibiis 4 posticis fusco cingulatis, alis subhyalinis.*

Oculi ocellique rufi: tibiæ intermediæ apice fuscæ: genua tarsique straminei, horum apices fusci: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo, $1\frac{1}{3}$ lin.)

Var. β.—tibiæ posticæ femoraque intermedia flavæ, fusco cingulatæ: tibiæ intermediæ femoraque antica flavæ.

Broad, thick: colour dark green: antennæ short and robust. September; near London. Isle of Wight.

Sp. 40. Callim. mæstus. Mas. *Nigro-viridis, pedibus nigris, tarsis flavis, alis hyalinis.*

Oculi ocellique rufo-fusci: scapus nigro-viridis: tibiæ nigro-fuscæ: genua tarsique flavi, horum apices fusci: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo, 1 lin.)

Tarsi fuscous: two basal joints yellow.
September; near London.

Sp. 41. Callim. apicalis. Mas. *Æneus, thorace anticè et posticè, capite pedibusque viridibus, tarsis flavis, alis subfuscis.*

Oculi ocellique rufi: antennæ crassæ: trochanteres genuaque flavi: tarsi apice fusci: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo, $1\frac{1}{4}$—$1\frac{1}{2}$ lin.)

Var. β.—Viridis, nitens: abdomen æneo maculatum.

The abdomen is sometimes green, with a small æneous spot in the centre: the antennæ are very thick.
August; near London.

Sp. 42. Callim. affinis. Mas et fem. *Viridis, abdomine æneo, oviductu corpore duplo longiore, pedibus fulvis, femoribus viridibus, alis subfuscis.*

Cinips affinis. *Fonscolombe, Ann. Sci. Nat. 26. 283.*

Oculi ocellique rufi: *feminæ* thorax anticè posticèque cyaneo-viridis: *maris* abdominis segmentum primum viride, *feminæ* cyaneo-viride: antennæ crassæ: scapus viridis, basi flavus: tibiæ posticæ fuscæ, apice flavæ: genua tarsique flavi, horum apices fusci: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo, 1—2 lin.)

Var. β.—*Mas,* thorax æneo-viridis.

Var. γ.—*Mas,* tibiæ 4 anticæ supra-fuscæ.

Var. δ.—*Fem.* abdomen viride, segmentum primum anticè viridi-æneum.

Abundant near London; on oak trees; from June to August.

Sp. 43. Callim. littoralis. Fem. *Viridis, præcedenti similis, at multò gracilior, oviductu breviore.*

(Alarum longitudo, $1\frac{3}{4}$ lin.)

In C. affinis the ovipositor is more, in this species it is less, than twice the length of the body.

May; near the sea-shore; Southampton.

Sp. 44. Callim. tarsalis. Fem. *Cyaneo-viridis, oviductu dimidio corpore longiore, pedibus stramineis, femoribus viridibus, tibiis fuscis, alis subfuscis.*

Oculi ocellique rufi: abdomen viride: scapus viridis, basi flavus: trochanteres flavi: tarsi apice fusci: nervus subcostalis pallidè fuscus: stigma minimum, concolor. (Alarum longitudo, $1\frac{1}{2}$ lin.)

It is more slender than C. quercus, and in shape much resembles the preceding species.

April; on grass in woods; near London.

Sp. 45. Callim. arvernicus. Fem. *Viridis, oviductu abdomine breviore, pedibus viridibus, genubus tarsisque stramineis, alis subfuscis.*

Oculi ocellique rufi: antennæ graciles: scapus viridis: trochanteres flavi: tarsi apice fusci: nervus subcostalis pallidè fulvus: stigma minimum, concolor. (Alarum longitudo, $1\frac{1}{4}$ lin.)

July; near Clermont, in Auvergne.

Sp. 46. Callim. notatus. Mas et fem. *Viridis, thoracis lateribus abdominisque segmento secundo æneis, oviductu abdomine multò longiore, pedibus viridibus, genubus tarsisque fulvis, alis subhyalinis.*

Oculi ocellique rufi : scapus viridis : trochanteres fulvi : tarsi apice fusci : nervus subcostalis fulvus : stigma magnum, nigro-fuscum. (Alarum longitudo, $1\frac{1}{4}$—$1\frac{2}{3}$ lin.)

Var. β.—*Mas,* abdomen apice viridi-æneum : tarsi antici fusci.

Var. γ.—*Fem.* thorax viridi-æneus, posticè æneus, lateraliter cupreus : scapus basi flavus.

Colour dark green : second joint of the antennæ æneous black.

May and June ; on grass in woods ; near London. Southampton.

Sp. 47. Callim. nigri-tarsus. Mas et fem. *Viridis, oviductu corpus longitudine æquante, pedibus viridibus, tibiis subtus tarsisque nigris, alis fuscis.*

Oculi ocellique rufi : *maris* abdomen viridi-æneum, basi viride : scapus viridis : nervus subcostalis fuscus, apice fulvus : stigma magnum, nigro-fuscum. (Alarum longitudo, $1\frac{3}{4}$ lin.)

The abdomen of the female has a slight æneous tinge, the basal segment is bluish green : the subcostal nervure is fuscous till it joins the margin, it then becomes fulvous.

August ; on grass in woods ; near London.

Sp. 48. Callim. straminei-tarsus. Mas. *Æneo-viridis, abdomine cupreo-æneo, femoribus viridibus, tibiis fuscis, tarsis 4 posticis stramineis, alis subhyalinis.*

Caput viride : oculi ocellique rufi : abdomen cupreo-æneum, basi viridi-æneum : thorax anticè posticèque viridis : scapus viridis, basi flavus : tibiæ anticæ flavæ : tarsi apice fusci : nervus subcostalis fuscus : stigma parvum, concolor. (Alarum longitudo, $1\frac{3}{4}$ lin.)

Apex of the abdomen æneous : antennæ slender : the intermediate tibiæ much paler than the posterior, yellow beneath.

July ; on grass in fields ; near London.

Sp. 49. Callim. antennatus. Mas. *Viridis, abdomine cupreo, pedibus rufis, femoribus viridibus, tibiis posticis tarsisque rufo-fuscis, alis subfuscis.*

Oculi ocellique rufi : thoracis discus abdominisque segmentum primum æneo-virides : scapus viridis : nervus subcostalis fuscus : stigma minimum, concolor. (Alarum longitudo, 2 lin.)

Var. β.—Abdomen æneo-cupreum : tibiæ pallidè rufæ, supra viridi-fuscæ, posticæ nigræ.

Mesothorax slightly tinged with æneous: abdomen cupreous beneath: antennæ long: trochanters and knees red: tips of the tarsi slightly fuscous.

May; Southampton. August; on grass in woods; near London. Scotland.

Sp. 50. Callim. lætus. Mas. *Æneo-viridis, nitens, abdomine cupreo, pedibus rufis, femoribus externè viridibus, alis hyalinis.*

Abdominis segmentum primum viride: tarsi flavi, apice fusci, antici rufi: alæ superiores marginem versus anticum flavescentes: nervus subcostalis nigro-fuscus: stigma concolor. (Alarum longitudo, 3—3½ lin.)

Var. β.—Alæ subfuscæ: tarsi omnes rufi.

July; near London.

Sp. 51. Callim. versicolor. Mas. *Viridis, nitens, abdomine cupreo, pedibus fuscis, femoribus viridibus, alis subhyalinis.*

Oculi ocellique rufi: abdomen basi viride: scapus viridis: tibiis posticæ nigræ, anticæ rufæ: tarsi basi flavi: nervus subcostalis fuscus: stigma minimum, concolor. (Alarum longitudo, 1¾—2 lin.)

Var. β.—Thorax posticè abdominisque segmentum primum æneo-virides, hujus apex cupreus: tibæ posticæ nigro-fuscæ.

Var. γ.—Scapus æneus: femora 4 postica concolores: tarsi omninò fusci: alæ subfuscæ, anticæ fusco prope stigma maculatæ.

Stouter than C. antennatus: antennæ thicker: wings broader: the superior wings have a large fuscous spot, occupying more than half their breadth, and extending along the nervure from whence it becomes costal, as far as the stigmal branch: sometimes this spot is indistinct, and the wings are nearly hyaline. Another and a very elegant variety has the head and thorax æneous green; the mesoscutum green; the first abdominal segment bright æneous green, cupreous toward the base; the apex and the second segment dark æneous, the others bright cupreous tinged with æneous; the coxæ and posterior thighs bluish green; the tibiæ and four anterior thighs æneous green; the anterior tarsi pale fuscous; the four posterior yellow, with the fourth and fifth joints fuscous.

September; near London. Isle of Wight. North of England. July; near Clermont, Auvergne.

Sp. 52. Callim. fusci-pennis. Mas. *Æneo-viridis, abdomine cupreo, antennis apice fuscis, pedibus viridibus, tarsis flavis, alis fuscis.*

Caput viride: oculi ocellique rufi: abdominis margo æneus: antennæ crassæ: scapus viridis: tarsi apice fusci: alæ anticæ ramulum versus stigmaticalem obscuriores: stigma parvum, fuscum. (Alarum longitudo, $1\frac{1}{2}$ lin.)

The antennæ, from the second to the sixth joint, are black, the following joints fuscous.

July; near London.

Sp. 53. Callim. minutus. Mas et fem. *Viridis, nitens, C. mutabili obscurior angustior, maris abdomine cupreo, oviductu abdomen longitudine æquante, pedibus flavis, femoribus viridibus, alis hyalinis.*

Maris abdominis segmentum primum viridi-æneum: scapus viridis: tibiæ supra pallidè fuscæ, posticæ et tarsorum apices obscuriores: nervus subcostalis fulvus: stigma parvum, concolor. (Alarum longitudo, $\frac{3}{4}-1\frac{1}{3}$ lin.)

Var. β. — *Mas*, abdomen æneum, basi viride: tibiæ 4 anticæ omninò flavæ.

Var. γ. — *Fem.* scapus basi et pedes flavi: femora postica basi virentia: tibiæ posticæ fusco cingulatæ.

July and August; on grass in woods; near London. May; Southampton.

Sp. 54. Callim. gracilis. Fem. *Viridis, nitens, oviductu abdomine paullò longiore, pedibus flavis, alis hyalinis quàm in præcedenti latioribus.*

Antennæ quàm in C. minuto tenuiores: femora postica basi virentia: tibiæ posticæ fusco cingulatæ. (Alarum longitudo, $1-1\frac{1}{3}$ lin.)

July; on grass in fields; near London.

Sp. 55. Callim. posticus. Fem. *Viridis, oviductu abdomine longiore, pedibus fuscis, tarsis flavis, alis subfuscis.*

Oculi ocellique rufi: scapus viridis: femora nigro-fusca: tarsi apice fusci. (Alarum longitudo, $1\frac{1}{2}$ lin.)

Dull green: longer than C. gracilis or minutus: legs more slender; wings longer: subcostal nervure and stigma pale fuscous; the latter small.

September; near Keswick, in Cumberland.

Sp. 56. Callim. exilis. Fem. *Viridis, oviductu abdomine paullò longiore, antennis fuscis, pedibus flavis, tibiis posticis femoribusque fusco cingulatis, alis hyalinis.*

Scapus flavus, apice fuscus: tarsi concolores: nervus subcostalis pallidè flavus: stigma parvum, concolor. (Alarum longitudo, ¾—1 lin.)

Var. β.—Antennarum articulus secundus niger.

July; in woods; near London.

Sp. 57. Callim. fusci-cornis. Mas et fem. *Viridis* mas, *aut æneo-viridis* fem. *abdomine æneo, oviductu abdomen longitudine æquante, antennis fuscis, pedibus flavis, femoribus viridibus, tibiis posticis supra fuscis, alis hyalinis.*

Abdomen basi viride, *feminæ* apex lateraque concolores: scapus æneus, *feminæ* basi flavus: *maris* antennarum articulus secundus nigro-viridis: tarsi apice fusci: nervus subcostalis pallidè flavus: stigma parvum, concolor. (Alarum longitudo, ¾—1 lin.)

Var. β.—*Fem.* femora fusca.

July; on grass in woods; near London.

Sp. 58. Callim. nitidulus. Fem. *Viridis, nitens, thorace anticè cyaneo-purpurascente, oviductu corpus longitudine æquante, antennis fuscis, pedibus flavis, alis hyalinis.*

Abdominis segmentum secundum æneum: scapus flavus: articulus secundus nigro-fuscus: femora basi virentia: tibiæ posticæ fusco cingulatæ: tarsi 4 postici apice fusci: nervus subcostalis pallidè stramineus: stigma parvum, concolor. (Alarum longitudo, 1¼ lin.)

Brilliant green: anterior part of the head blue.
June; on grass in woods; near London.

Sp. 59. Callim. ater. Mas. *Ater, tibiis fuscis, tarsis flavis, alis hyalinis.*

Caput et thorax obscuri, punctati: abdomen nitidum, glabrum: tibiæ 4-anticæ pallidè fuscæ, subtus flavæ: tarsi 4-postici apice fusci: nervus subcostalis fuscus: stigma parvum, obscurius. (Alarum longitudo, 1½ lin.)

May; near London.

Sp. 60. Callim. pubescens. Fem. *Viridis aut æneo-viridis, oviductu abdomine paullò longiore, pedibus pallidè rufis, femoribus viridi-æneis, alis subfuscis.*

Oculi ocellique rufi : abdomen æneum, pilosum, basi viride : scapus pallidè rufus : tibiæ posticæ fuscæ : tarsi straminei : alæ anticæ prope stigma fusco maculatæ. (Alarum longitudo, $2\frac{1}{2}$ lin.)
Var. β.—Scapus æneo-fuscus : tibiæ posticæ rufæ.

Head green : mesoparaptera æneous : first abdominal segment green, apex æneous ; second segment æneous, base chalybeous, apex cupreous : second antennary joint æneous : subcostal nervures paler toward the base of the wings.

July ; on windows ; near London. South of France.

This species has the proscutellum more developed than any of the preceding : the stigma is longer and thicker.

It resembles Diplolepis obsoletus, *Fabr.*

Sp. 61. Callim. stigma. Fem. *Ater, oviductu abdomine paullò longiore, alis fuscis.*

Ichneumon. . . . . *Fabr. Ent. Syst.* II. 188. 229.
Diploplepis stigma . *Fabr. Syst. Piezat.* 152. 21.
Cinips stigma. . . *Fonscolombe, Ann. Sci. Nat.* 26. 289.

Oculi ocellique rufi : tarsi fusci : alæ basi subhyalinæ, anticæ prope stigma nigro-fuscæ. (Alarum longitudo, $2\frac{1}{4}$ lin.)

This species resembles the preceding in structure. Mr. Curtis has reared it, with C. bedeguaris, from the galls of the dog-rose, in the months of July, August, and September.

Genus V. Ormyrus. *Westwood.*

Caput magnum : palpi maxillares articulis 1° et 2° brevibus, 3° medio, 4° crassiore elongato subfusiformi : mentum ovatum, posticè quadratum : mandibulæ arcuatæ, tridentatæ, dens interna obtusa : *maris* antennæ clavatæ, articulo 1° elongato, 2° brevi, 3° et 4° brevissimis, 5° et sequentibus ad 10° cyathiformibus, tribus ultimis approximatis clavam componentibus obliquè truncatam ; *feminæ*, articulo 2° cyathiformi, 5° et sequentibus ad 10um gradatim brevioribus, tribus ultimis clavam componentibus ovatam duos præcedentes longitudine æquantem : thorax gibbus ; prothoracis scutellum breve ; mesothoracis scutum magnum, scutellum gibbum ovatum apice acuminatum, super metathoracis præscutum extendens ; metascutellum magnum, canaliculatum : *maris* abdomen convexum, elongato ovatum, basi elevatum : *feminæ* subcompressum : tibiæ posticæ arcuatæ : alæ pilosæ.

Cinips tubulosa, *Fonscolombe*, may perhaps belong to this genus.

Sp. 1. Orm. punctiger. Mas et fem. *Æneo-viridis, maris abdomine nigro, pedibus nigro-viridibus, tibiis anticis tarsisque fuscis, alis fuscis.*

Ormyrus punctiger. *Westwood. Lond. & Edin. Phil. Mag. & Journ. of Science,* Third Series, No. II. p. 127.

Mas. Viridis, pilosus: oculi ocellique rufi: thorax posticè æneo-viridis: abdomen obscurum, segmentum primum nigro-viride, secundum punctis transversò unifasciatum, tertium et quartum eodem modo trifasciata: antennæ nigræ, apice fuscæ: genua fusca: nervus subcostalis nigro-fuscus: stigma parvum, concolor.

Fem. Viridi-æneus: scutellum cupreo-æneum: abdominis segmentum secundum et sequentia punctis bifasciata: oviductus subexsertus: alæ flavo-fuscæ: nervus subcostalis fuscus: stigma concolor. (Alarum longitudo, $1\frac{1}{2}$—$2\frac{1}{2}$ lin.)

Var. β.—*Fem.* viridis: abdomen æneo-viride: tarsi flavi.

Var. γ.—*Fem.* abdomen nigro-æneum, segmentum primum viride.

June to August; on grass beneath oak trees; near London.

Sp. 2. Orm. nigro-cyaneus. Mas. *Cyaneus, abdomine nigro, pedibus nigro-viridibus, tibiis anticis tarsisque fuscis, alis hyalinis.*

Caput viride: oculi ocellique rufi: abdomen præcedenti simile: antennæ fuscæ, articulis 1° et 2° nigris: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo, $1\frac{1}{3}$ lin.)

More depressed than the preceding species: antennæ and legs slenderer.

June; on grass in a wood; near London.

Genus VI. Perilampus. *Latreille, Dalman.*

Cynips. *Fabr. Oliz. Lat.*
Diplolepis *Fabr. Panz.*
Chalcis . *Jur. Panz.*

Caput maximum: palpi maxillares articulo 1° medio, 2° 3° que brevioribus, ultimo elongato, subfusiformi, internè sinuato: mentum elongatum, posticè conicum: mandibulæ arcuatæ, una bidentatæ, altera tridentata: labrum minutum, quadratum, anticè spinosum: antennæ articulo, 1° elongato, 2° minuto, 3° minutissimo, 4° magno, 5° et sequentibus ad decimum, cyathiformibus, tribus ultimis clavam componentibus ovatam: thorax gibbus,

profundè punctatus: prothoracis scutellum breve; mesothoracis scutum gibbum, scutellum magnum, apice acuminatum, supra metathoracis præscutum extendens; metascutellum benè determinatum, canaliculatum: abdomen subpetiolatum, convexum, breve, latum, contractum: oviductus absconditus.

Dalman has given an elaborate description of the external anatomy of this genus, and has added the characters of several species. He supposes *Perilampus micans* to be a parasite of *Lyctus canaliculatus* and *Dendrophilus picipes*, particularly of the latter.

Sp. 1. Peril. pallipes. *Curtis.* Mas et fem. *Æneo-viridis, abdomine pedibusque cyaneis, antennis fulvis, genubus tarsique flavis, alis subhyalinis.*

Diplolepis ruficornis. *Fabr.? British Entomology.* Pl. 158.
Perilampus ruficornis. *Latr. Fonscolombe.?*

Caput æneum: antennæ articulis primo et secundo nigris. (Alarum longitudo, 4—6 lin.)

Taken in July at Dover, and beaten out of the juniper bushes at Birch Wood, by Mr. Newman and Mr. Davis, in April and May.

Sp. 2. Peril. nigricornis. *Newman.* Mas et fem. *Æneus, abdomine cyaneo, antennis nigris, pedibus nigro-viridibus, tarsis flavis alis hyalinis.*

Diplolepis violacea. *Fabr. Syst. Piezat.* 149. 4. &c.?
Chalcis violacea. *Panz. Faun. Germ.* 88. p. 15.?
Perilampus violaceus. *Dalman. Stock. Trans.* 1822. 398.?
Id. . . *Fonscolombe. Ann. Sci. Nat.* 26. 300.?

Oculi ocellique fusci: scapus viridis: tarsi apice genuaque fusci. (Alarum longitudo, 2—$3\frac{3}{4}$ lin.)

Var. β.—Abdomen viridi-cyaneum.
Var. γ.—Thorax æneo-viridis.

Fonscolombe's description of *Perilampus violaceus* agrees very well with the above. Dalman says, that the 4 anterior legs are yellow, the thighs blue. Panzer represents them as entirely yellow.

Taken by Mr. Newman, in company with the last.

Sp. 3. Peril. Italicus. Mas et fem. *Cupreus, abdomine antennisque nigris, pedibus nigro-viridibus, tarsis flavis, alis subhyalinis.*

Cynips et Diplolepis Italica. *Fabr.*, &c.
Perilampus Italicus. . . *Latr. Fonscolombe*, &c.

Caput viridi-æneum: oculi ocellique fusci: metathorax nigro-viridis: scapus viridis: tarsi apice genuaque fusca: nervus subcostalis fuscus: stigma parvum, concolor. (Alarum longitudo, $3\frac{1}{2}$ lin.)

It resembles *Perilampus splendidus*, Dalman, but the abdomen is quite black. Fonscolombe's description does not well agree with the specimens that I have seen.

July; on oak, box, and lime trees; near London.

Sp. 4. Peril. aureo-viridis. *Stephens. Viridi-æneus, abdomine aureo nitido, antennis nigris, pedibus piceo-viridibus, geniculis tarsisque rufo-flavis, alis hyalinis.*

Rather less than *P. nigricornis;* taken near London, in July.

Sp. 5. Peril. auriceps. *Stephens. Nigro-æneus, abdomine atro nitido, capite viridi-aureo, antennis nigro-piceis, pedibus rufo-ochraceis, femoribus basi viridibus, tibiis posticis medio fuscis.*

Size of No. 4.—This and the following species are narrower than the others of the genus, and the abdomen is dissimilar in form, being somewhat *lanceolate* acute. The size of *P. nigricornis.*

Found amongst grass near Ripley, in June, 1827.

Sp. 6. Peril. femoralis. *Stephens. Viridi-æneus, abdomine atro nitido, antennis piceis, tibiis anticis et intermediis tarsisque omnibus rufo-ochraceis.*

Perilampus micans. *Dalman. Stock. Trans.* 1822. *var.*?

Rather larger and broader than the last; taken near Hertford in July.

Mr. Stephens, hearing that I was engaged in describing the genus *Perilampus,* most obligingly transmitted me the above descriptions of the three last species through the hands of Mr. Newman.

Art. XVI.—*Observations on Blight.* By Rusticus.

Epistle II.

Sir,—I don't know why our brethren on the other side the Atlantic are charged with sending us the greatest pest of our orchards, but so it is. We call an insect the American blight, which for aught I could ever make out, may have come from China or Botany Bay. However, a name once in vogue will have its day; and one might as well attempt to turn a pig in an entry as argue against an established belief; so American blight it shall be. In very hot weather you may now and then see this blight on the wing; it has just the look of a bit of cotton, or a downy seed, floating in the air, and is driven by every breath of wind quite as readily. If you catch and examine it, you will find it to be just like the plant-louse which infests our rose-trees, &c.; but, unlike all other plant-lice, it is clothed and muffled up with cotton-wool, in such quantities, that you would at first have no more idea that the lump contained an insect, than that the mass of clothes on a stage-coach box in winter, contained a man. Some folks wonder what can be the use of so much clothing; I am not much of a theorist, but I should guess that the vermin came from the torrid zone, and Nature kindly furnishes this garment to protect them from the cold of our climate.

These blights wander wherever it pleases the wind to carry them; and if bad luck should drive one of them against the branch of an apple-tree, there it will stick, creep into a crack in the bark, bring forth its young, and found a colony; the white cotton soon appears in large bunches; branch after branch becomes infected; the tree grows cankery, pines, and dies. How this is effected no one knows, though the cause and effect are too evident to escape the notice of the commonest clown. In large orchards it is vain to hope for a cure, but not so in gardens. Directly you see the least morsel of cotton, make up your mind to a little trouble and you will get rid of it. In the first place, get a plasterer's whitewashing-brush, then get a large pot of double size, make your man heat it till it is quite liquid, then go with him into the garden and see that he paints over every patch of white, though not

bigger than a sixpence; the next morning have the size-pot heated again, and have another hunt; and keep on doing so every morning for a fortnight. Your man will tell you it's no use; tell him that's your business, not his: your neighbours will laugh at you for your pains: do it before they are up. I have tried it and know it to be effectual. Spirit of tar has been used with partial effect, so also has resin; whitewashing has been often tried, and, as it contains some size, is not entirely useless, and some horticulturists think it ornamental: I do not.

Now for the moth. This is a beautiful little creature, its wings are studded with silvery shining specks, as though they were inlaid with precious gems. It is the most beautiful of the beautiful tribe to which it belongs, yet from its habits not being known, it is seldom seen in the moth state, and the apple-grower knows no more than the man in the moon to what cause he is indebted for his basketsful of worm-eaten windfalls in the stillest weather. To find the moth in the day-time, the trunks of the apple-trees should be carefully looked over; or if your orchard be surrounded by a wooden fence, it may frequently be found sitting against it, with its pretty wings neatly folded round it. Towards evening, in fact, just at sun-set, it begins to move, and may then be seen hovering about the little apples, which, by the time the moth leaves the chry-salis, the middle of June, are well knit, and consequently fit for the reception of its eggs, which it lays in the eyes, one only in each, by introducing its long ovipositor between the leaves of the calyx, which form a tent above it that effectually shields it from the inclemency of the weather, or any other casualty. As soon as the egg hatches, the little grub gnaws a hole in the crown of the apple, and soon buries itself in its substance; and it is worthy of remark that the rind of the apple, as if to afford every facility to the destroyer, is thinner here than in any other part, and consequently more easily pierced. The apple most commonly attacked is the codling, a large early sort, which ripens in July and August.

The grub, controlled by an unvarying instinct, eats into the apple obliquely downwards, and by thus avoiding the core and pips in no way hinders its growth: at first it makes but slow progress, being little bigger than a thread, but after a fortnight its size and its operations have much increased; it

has now eaten half way down the apple, and the position of the hole at the top, if the apple continue upright, or nearly so, is inconvenient for a purpose it has up to this time been used for, that is, as a pass to get rid of its little pellets of excrement, which are something like fine sawdust or coarse sand; another communication with the outer air is therefore required, and it must be so constructed as to allow the power of gravity to assist in keeping it clear; it is accordingly made directly downwards towards that part of the apple which is lowest, and thus the trouble of thrusting the pellets upwards through the eye of the apple is saved, and a constant admission given to a supply of air without any labour. The hole now made is not, however, sufficiently open for an observer to gain by its means any knowledge of what is going on within; this is only to be obtained by cutting open a number of the apples as they gradually advance towards ripeness; the hole is, however, very easily seen, from its always having adhering to it on the outside an accumulation of the little grains which have been thrust through. Having completed this work the grub returns towards the centre of the apple, where he feeds at his ease. When within a few days of being full fed, he for the first time enters the core through a round hole gnawed in the hard, horny substance which always separates the pips from the pulp of the fruit, and the destroyer now finds himself in that spacious chamber which codlings in particular always have in their centre. From this time he eats only the pips, never again tasting the more common pulp which hitherto had satisfied his unsophisticated palate: now nothing less than the highly flavoured, aromatic kernels will suit his tooth, and on these for a few days he feasts in luxury.

Some how or other, the pips of an apple are connected with its growth, as the heart of an animal with its life;—injure the heart, an animal dies: injure the pips, an apple falls. Whether the fall of his house gives the tenant warning to quit, I cannot say, but quit he does, and that almost immediately; he leaves the core, crawls along his breathing and clearing-out gallery, the mouth of which, before nearly closed, he now gnaws into a smooth, round hole, which will permit him free passage without hurting his fat, soft, round body; then out he comes, and for the first time in his life finds himself in the open air. He now wanders about on the ground till he finds the stem of a

tree: up this he climbs, and hides himself in some nice little crack in the bark. I should remark, that the fall of the apple, the exit of the grub, and his wandering to this place of security, usually take place in the night time. In this situation he remains without stirring for a day or two, as if to rest himself after the uncommon fatigue of a two yards' march; he then gnaws away the bark a little in order to get further in out of the way of observation; and having made a smooth chamber big enough for his wants, he spins a beautiful little milk-white silken case, in which, after a few weeks, he becomes a chrysalis, and in this state remains throughout the winter and until the following June, unless some unlucky, blackheaded tit, running up the trunk, peeping into every cranny, and whistling out his merry see-saw, happen to spy him, in which case he is plucked without ceremony from his retreat, and his last moments are spent in the bird's crop; but supposing no such ill-fortune betide him, by the middle of June he is again on the wing, and hovering round the young apples on a midsummer evening as before.

By burning weeds in your gardens at this time of year you will effectually drive away this little moth. If you have trees the crops of which you value, make a smoking (mind, not a blazing) fire under each; it will put you to some inconvenience if your garden be near your house, but the apples will repay you for that.

If you think these observations on the blights of the apple worth recording, you shall hear from me again, (as I have made similar notes on the hop-fly, turnip-fly, &c.) I have sent Mr. Loudon a few notes on birds, which I believe do not come within the compass of your Mag.

Yours, &c. RUSTICUS.

Godalming, Aug. 14, 1832.

Art. XVII.—*Catalogue of Diptera occurring about Holywood in Downshire.* By A. H. Haliday, Esq., M.A.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

Sir,—I send you a list of some Diptera occurring about Holywood, in the county of Down. Should you think it not unsuited to the pages of the Entomological Magazine, the Notes appended will afford the necessary explanations of the nomenclature adopted, where it differs from that of Meigen or of the published British Catalogues. As I am aware that a bare local catalogue may not seem of sufficient general interest to occupy so many pages, I should probably not have thought of it had time allowed me to offer any contribution of greater labour and detail. Perhaps, however, as referring to a district in this respect nearly unexplored, this list may afford some hints for the advancement of our Insect Geography. I am sorry therefore to present it in so meagre a form, many of the most extensive genera being unexamined in detail. These are indicated by the asterisk prefixed; and some of them I have thought it better to pass over entirely. Perhaps, however, a few facts may be gleaned from it, such as it is. The total absence of the families of *Bombylii* and *Asili* is observable; and, considered in connexion with the small proportion which the British species bear to the European in the aggregate, seems a result partially determining the law of progressive distribution among these forms. The disappearance or extreme rarity of the finer genera (the *Optimates*) among the *Tabani*, *Stratiomydes*, *Syrphi*, &c. may also be remarked, as well as the absence of various conspicuous (and in this point of view more insulated) groups, such as *Ctenophora*, *Aspistes*, *Pachygaster*, *Platypeza*, *Diaphorus*, *Echinomyia*, *Gymnosoma*, *Micropeza*, *Platystoma*, &c. On the other hand, the predominance of particular tribes may afford some indications; the *Dolichopi*, as a family, are pretty full (so also the minuter *Tipulidæ*, though not appearing from this catalogue); the *Muscidæ*, of less typical structure (all the genera after *Cænosia*, or perhaps *Scatophaga ?*) are by no means scanty. A few groups seem to approach their culminant point; *Cælopa*, a genus unknown to the shores of the continent, and even on the Scanic peninsula confined to one described species, here

numbers five or six, all rich in individuals, and exercising no unimportant functions in the economy of nature. *Tachypeza arenaria*, which sometimes swarms upon our coasts, has many analogies of structure with its companions, the swift-footed but heavy-winged *Orygmæ* and *Cœlopæ*, and like them is probably confined to a northern range. Not to detain you further with remarks that may appear obvious or trivial, I will only add my best wishes for the success of your undertaking; and am, Your very obedient, &c.

ALEX. HENRY HALIDAY.

Clifden, near Holywood, Oct. 10th, 1832.

Culex
annulatus
cautans
nemorosus
detritus, N.S.
pipiens
Anopheles
maculipennis
bifurcatus
plumbeus
Corethra *
culiciformis
Tanypus *
Chironomus *
virescens?
Culicoides *
palustris
scutellatus
pulicarius
obsoletus
nubeculosus
subsultans
Ceratophogon
stigma
albicornis
ornatus
annulipes
. distinctus, N.S.
. brachialis, N.S.
. gracilis, N.S.
flavipes
rufipes
ferruginea
Sphæromyas
concinnus. *Meig.*
varipes. *St.*
annulitarsis, *St.*
Serromyia
femorata
morio
Psychoda *
phalænoides
nervosa
fuliginosa
palustris
ocellaris
Erioptera *
maculata
varia
atra
ULA, N.G.
mollissima, N.S.
Limnobia *
C. fasciata
marmorata
decora, N.S.
Limnobia *
E. fuscipennis
nitidicollis
F. nemoralis
F.a. senilis, N.S.
G. ferruginea
H. littoralis
O. albifrons
tripunctata
nubeculosa
pabulina
P. Xanthoptera
quadrinotata
R. tenella
U. immaculata
V.a. demissa, N.S.
V.b. pavida, N.S.
DICRANOMYIA, *St.*
modesta
chorea
lutea
musta
oscillanis, N.S.
GLORHINA, *Meig*
[VI.?
leucocephala
dumetorum
Geranomyia, N.G.
unicolor, N.S.
Rhamphidia
longirostris
Symplecta *
stictica
Rhipidia
maculata
Pedicia
rivosa
Dolichopeza
sylvicola
Ptychoptera
albimana
scutellaris
paludosa
lacustris
Tipula *
gigantea
lutescens?
paludosa
oleracea
dispar, N.S.
luteipennis?
flavolineata
nubeculosa? & 6
A.a. annulicornis
B. crocata
cornicina
Trichocera
hyemalis
fuscata
annulata
regelationis
Dixa
nebulosa
maculata
aprilina
æstivalis
serotina?
Macrocera
lutea
phalerata
fasciata
Bolitophila
fusca
Platyura *
Sciophila
marginata
rufa
Leja *
fuscipennis
bimaculata
Winthemi
Cordyla
crassicornis
fusca
fasciata
Mycetophila *
limata, *Meig.*
arcuata
cingulum
lineola
lunata, *Fabr.*
nigra
Sciara *
Thomæ
morio
flavipes
Orphnephila
devia, Z.J.
ANARETE, N.G.
candidata, N.S.?
Lestremia
leucophæa
CATOCHA, N.G.
latipes, N.S.
Campylomyza *
atra
Cecidomyia *
pictipennis
annulipes
Lasioptera *
Scatopse *
A. punctata
Scatopse *
nigra
B. minuta
infumata, N.S.
Dilophus
vulgaris
femorata
Bibio
Marci
leucopterus
Pomonæ
Johannis
nigriventris, N.S.
lanigerus, *m.* } *vernalis, f.* }
clavipes
Simulia *
sericea & 3
Rhyphus
punctatus
fenestralis
ochraceus, *Curtis?*
Beris
geniculata, B.E.
chalybeata
vallata
clavipes
Hæmatopota
pluvialis
ocellata
Chrysops
viduatus
Spania
Fallenii, N.S.
Rhagio
scolopaceus
tringarius } *vanellus* }
lineola
Leptis
aurata
Thereva
cincta
Hybos
funebris
vitripennis
Cyrtoma
nigra?
atra
melæna, N.S.
Ocydromia
scutellata
glabricula
rufipes
Trichina
clavipes

Trichina
elongata, N.S.
Rhamphomyia *
sulcata
tephrea
cinerasceus
nigripes
tenuirostris
cæsia
flava
longipes & 6
Empis
tessellata
pennipes
pennaria
chioptera
pilipes
livida
stercorea
testacea
Pachymeria, *St.*
ruralis
Hilara *
globulipes
chorica
clypeata
nigrina
litorea
modesta
flavipes
Hemerodromia
A. Monostigma
præcatoria
melanocephala
albicornis
B. supplicatoria
HELEODROMIA, N.G.
A. immaculata, N.S.
B. bipunctata, N.S.
stagnalis, N.S.
fontinalis, N.S.
LEPTOSCELES, N.G.
irroratus
exoletus, N.S.
guttatus
TACHYPEZA, *Meig.* [VI. 341
arrogans
cimicoides
umbrarum, N.S.
truncorum
arenaria, N.S.
Tachydromia
flavipes
fasciata
annulipes
albocapillata
albiseta
nigritarsis
minuta
annulata
Drapetis
aterrima, B.E.
Opetia
nigra
lonchopteroides, [N.S.?
Callomyia
antennata
leptiformis
Pipunculus
A. campestris, *f.* ater, *m.*
varipes
flavipes
B. auctus
C. spurius
exiguus, N.S.
Medeterus
regius
Medeterus
notatus
viridis
conspersus, Z.J.
bipunctatus
balticus
præcox
scambus
curvipes
loripes, Z.J.
prodromus, Z.J.
truncorum
muralis
tenellus
Chrysotus *
læsus
copiosus
neglectus
femoralis
nigripes
Psilopus
platypterus
Machærium
Maritimæ, Z.J.
Rhaphium
macrocerum
caliginosum
Porphyrops
B. decoratus, Z.J.
pallipes
——— N.S.?
pumilus
——— N.S.?
insulsus, Z.J.
riparius
rufipes / *riparius*, Z.J. *m.*
obscuratus
flavicollis
A. diaphanus
leucocephalus / *fulgens*. Z.J.
argyreus
argentinus
vestitus
aulicus
C. annulipes
flaviventris
——— N.S.
——— N.S.
Dolichopus
A. nitidus
jucundus, N.S.?
festivus, Z.J.
Diadema, Z.J.
popularis
pennatus
urbanus
pennitarsis
thalassinus, Z.J.
acuticornis
linearis
inquinatus, Z.J.
trivialis, Z.J.
actæus, Z.J.
vitripennis
fuscipes, Z.J.
clavipes, Z.J.
A. a. litoreus / *plumipes*, Z.J.
B. planitarsis
fastuosus, Z.J.
brevipennis
equestris, Z.J.
ungulatus
campestris
B. b. cupreus
ærosus
sarus, Z.J.
nigripennis
Hypophyllus, H.Z.J.
obscurellus
Scenopinus
niger
Sargus
politus
flavicornis
formosus
flavipes
cuprarius
Nemotelus
uliginosus
nigrinus
Oxycera
trilineata
Odontomyia
Hydroleon
Stratiomys
furcata
Chrysotoxum
bicinctum
Paragus
femoratus
Ascia
podagrica
floralis
dispar
Baccha
nigripennis
elongata
scutellata
Xylota
pipiens
segnis
sylvarum
Pipiza
noctiluca
signata
vitrea
funebris
virens
Rhingia
rostrata
campestris
Chrysogaster *
Cheilosia, * *Meig.*
œstracea [*olim.*
variabilis
flavicornis
Syrphus *
Pyrastri
Ribesii
Corollæ
albostriatus
bifasciatus
tricinctus
nectareus
———
scutatus
peltatus
clypeatus
manicatus
Ocymi, *f.* / *lobatus*, *m.*
Rosarum
Syrphus, *p.*
Menthastri
Melissæ
scriptus
tæniatus
Sericomyia
borealis
Helophilus
pendulus
trivittatus
lineatus
Eristalis *
floreus
Eristalis *
sepulchralis
tenax
intricarius
similis
Volucella
bombylaus
mystacea
pellucens
Myopa
atra
testacea
Siphona 1
cinerea
tachinaria
Stomoxys
calcitrans
stimulans
Tachina & 6. *
Mesembrina
meridiana
Sarcophaga *
carnaria
Dexia *
canina
Musca
A. Cæsar
regalis
Chloris, N.S.
B. Vomitoria
erythrocephala
rudis
degener, N.S.
macellaria, N.S.
domestica
stabulans
hortorum
cyanella
maculata
meditabunda
Anthomyia *
lardaria
assimilis
notata
dentimana
erratica
pagana
Angelicæ
impuncta
strigosa
manicata
canicularis
dentipes
ciliata
triquetra
diaphana
inanis
Drymeia
obscura
Lispe
tentaculata
litorea
? adscita, N.S.
Cœnosia *
verna
tigrina
pedella
Schœnomyza, N.G.
fasciata / *Sciomyza fasciata*
litorella [*Meig.* / *Ochthiphila lito-*
Cordylura [*rella*, M.
pudica
albipes
spinimana
punctipes
obscura
hydromyzina

Scatophaga
scybalaria
stercoraria
merdaria
analis
lutaria
spurca
inquinata
eximia, B.E.
Ostiorum, B.E.
squalida
rufipes
rudis, B.E.
litorea
decipiens, B.E.

Dryomyza
flaveola
mollis, N.S.?
præusta

Cælopa
frigida
gravis, N.S.
simplex, N.S.
parvula, N.S.
sciomyzina, N.S.

Orygma
luctuosa

Actora
buccata, *Fall.*

Helomyza
A.pallida
præusta
tigrina
rufa
B.ustulata?
serrata
inscripta

Heteromyza
oculata
atricornis

Sciomyza *
A.nigrimana
griseola
albocostata
B.monilis
cinerella
nana

Tetanocera
marginata
rufifrons
obliterata
Hieracii
Umbrarum
arrogans
elata
media
sylvatica
vittata, N.S.
aratoria
dorsalis
lineata

Sepedon
sphegeus
Hæffneri

Piophila
luteata, N.S.
atrata
Casei
nigriceps

Pandora, N.G.
scutellaris, *Fall.*
basalis, N.S.

Sepsis
A.Punctum
hilaris
cynipsea
B.cylindrica
annulipes
Leachii
putris
superba, N.S.
minor, N.S.

Ortalis
pulchella
crassipennis
Cerasi
vibrans

Tephritis
Zoë
continua
cognata
Onopordinis } *Centaureæ*
Arctii
marginata
cuspidata
Arnicæ
Plantaginis, N.S.
flavicauda
Leontodontis
radiata
Sonchi

Lonchæa
chorea

Lauxania
ænea
amica, N.S.
sordida, N.S.
lupulina

Sapromyza, *p.*
pallidiventris
trimacula
ustulata
umbellatarum
arcuata
10-punctata

Sapromyza, *sicut St.*
flava
præusta
rorida
pallida

Palloptera, *Fall.*
unicolor

Heteroneura
albimana
? spurca, N.S.

Psila
pallida
Rosæ
nigricornis?

Calobata
petronella

Loxocera
elongata
ichneumonea

Stegana
annulata, N.S.

Ochthiphila
aridella
polystigma

Leucopis
puncticornis
obscura, N.S.

Agromyza *
nigripes
mobilis
bimaculata
anthracina
acuticornis } deuticornis
variegata
luctuosa
ænea
strigata
Orbona

Phytomyia *
festiva
lateralis
affinis
flavicornis

Ochthera
Mantis

Ephydra
glabricula
cesta, N.S.
rufipes
infecta, N.S.
aquila
coarctata
litoralis
fossarum, N.S.
hecate, N.S.
spilota, B.E.
curvicauda
albula?
riparia
micans, N.S.
pygmæa, N.S.
. sibilans, N.S.
leucostoma
æstuans, N.S.
stagnalis
paludum
lutosa, N.S.
compta, N.S.
noctula
Graminum, N.S.?
quadrata
defecta, N.S.
picta
interrupta, N.S.
interstincta
flavipes
posticata
stictica

Notiphila *
cinerea
leucostoma
griseola
chrysostoma
erythrostoma
albiceps
albilabris
flaviventris
madizans, *Fall.*

Drosophila
flava
graminum
tristis } *cellaris L.?*
melanogaster
ingrata, N.S.
virginea?
phalerata
transversa
cameraria, N.S.
fenestrarum
funebris

Diastata
obscuripennis
punctum
obscurella

Opomyza
Germinationis
florum
var. punctata
combinata
tripunctata
tremula, N.S.
asteia, N.S.

Asteia
amæna

Gymnopa
glabra

Chlorops *
A.lateralis, N.S.
fulvifrons, N.S.
Cereris
agnata, N.S.
messoria
tæniopus
glabra
lineata?
hypostigma
B.brevipennis
cornuta
albiseta
maura, &c.

Meromyza
variegata
saltatrix
pratorum

Borborus *
subsultans
denticulatus
hamatus, N.S.?
equinus
sylvaticus
limosus
clunipes
ochripes
nivalis, N.S.
nigerrimus, N.S.

Phora *
A.incrassata
B.thoracica
bicolor
nigra
flava
lutea
C.crassicornis
abdominalis, *Fall.*
E.debilis, N.S.
G.Dauci, *f.* [*Meig* } *Conicera atra*, *m.* }
. similis, N.S.
F.aterrima
galeata, N.S.

Taken at Tullymore Park, and on the Mountains of Mourne.

Orphnephila devia
Sciara bicolor
Dicranomyia oscillans
Limnobia 4-notata
Tachydromia gilvipes

Callomyia elegans, *f.*
Pipiza interrupta, N.S.
Sphegina clunipes
Medeterus alpinus, N.S.
Dolichopus patellatus
atratus

Dolichopus rupestris, N.S.
Conops 4-fasciata
Sapromyza inusta
Phyllomyza litura, } *Sapromyza litura*, Meig. }

Among the Sandhills, Dundrum Bay.

Thereva annulata
Myopa ferruginea
Stomoxys Siberita
Meromyza viridula, N.S.

County Wicklow, Vale of Clara; Avondale, and the Seven Churches.

Orphnephila devia
Limnobia picta
Dolichopeza sylvicola
Bibio dorsalis
Asilus æstivus
Bombylius minor
Hilara matrona, N.S.
Tachydromia lutea
pectoralis
cursitans
Trichina clavipes
Medeterus alpinus
Diaphorus Winthemi
Porphyrops crassipes
Dolichopus plumipes
atratus
cyaneus
patellatus
urbanus
Sphegina clunipes
Dryomyza anilis
Sepsis superba
Ortalis Syngenesiæ
Tephritis Florescentiæ
Lauxania cylindricornes
Ochthera Mantis
Agromyza securicornis
flavo-notata, N.S.

In the County Galway.

Orphnephila devia
Callomyia antennata
leptiformis
Sapromyza femorella, *Fall.*

Taken in different parts of England.

Ceratopogon pictus
Sciophila pictipennis, N.S.
Bibio fulviventris
leucopterus
albipennis
varipes
. hybridus, N.S.
Dioctria Baumhaueri
Tachypeza Graminum
Myopa pusilla
occulta
Pipunculus modestus, N.S.
Cordylura apicalis
Lauxania longipennis
Dorycera Graminum
Tetanocera cucularia
var. β. γ.
Eurina lurida
Camarota aurifrons, N.S.
Borborus pedestris

On the Sands of Portmarnock, near Dublin.

Pipunculus sylvaticus
Thereva annulata
Scatophaga decipiens
Lucina fasciata.
Psila atra
Chlorops fulvifrons, N.S.
Ephydra puncto-nervosa

ABBREVIATIONS.

B. E. Curtis' British Entomology.
St. Stephens' Systematic Catalogue.
Z. J. Zoological Journal, No. XIX.
The remaining synonyms are from Meigen, unless otherwise expressed.

NOTES.

Culex detritus. *Nigro-fuscus, abdomine pallido-annulato, ventre trifariam fusco-punctato, femoribusque basi luteis.*

Size of *C. pipiens*. Palpi of male rather thick, as long as the proboscis. Wings thickly clothed with dusky black scales: disk of the thorax nearly naked.

In multitudes during the day among hedges on the sea-coast: in the evening, in columns about the tops of trees, appearing like smoke at the distance of a furlong.

Anopheles plumbeus.

Probably a small variety of *A. bifurcatus*, but my original specimens have fallen a prey to Psoci.

Chironomus virescens.

This little fly caused no little alarm this summer: its appearance in swarms being adjudged by vulgar rumour a precursor of cholera. In some places they appeared in such numbers, that the inhabitants had some trouble in *shovelling* them out of their houses (in my informant's words). At Donaghadee, clouds (of this species) were observed coming from seaward. To prevent any error about the species, I add a description of mine:—

Length .08:[a] colour light yellow, with three faint reddish stripes on the thorax, the middle one not extending as far as the scutel: abdomen greenish yellow: antennæ and ends of feet darker: poisers pale: wings naked, hyaline, with pale nervures.

Ceratopogon distinctus. *Flavus; capite, antennis basi, thoracis dorso, metathorace genubusque nigris.*

Size of *C. ornatus*. Antennæ dusky yellow: thorax shining, scutel yellow: hind shanks dusky: wings hyaline: poisers milk white: fore thighs thick spinous.

C. brachialis. *Niger, nitidus, abdominis basi, pedibus anterioribus et femoribus posticis luteis, geniculis nigris.*

Form of the last: hind shanks black, rufescent at both ends: hind feet yellowish at the base: wings hyaline, with thick nervures: poisers black: antennæ dusky yellow, the root black.

C. gracilis. *Flavus; vertice, thoracis dorso, abdomineque nigris, nitidis.*

All the thighs slender, fore pair bristly beneath the tip, hind thighs and shanks dusky: wings hyaline, with distinct nervures, smaller, and more slender than the preceding.

Sphæromyas concinnus. *Abdomine albo, postice fasciis tribus nigris.*

Cer. concinnus. *Meig.* 1.

Resembles *S. varipes* in almost every respect, but the black bands of the abdomen are constant.

It is very abundant about Lough Neagh, less so at Holywood.

Sph. varipes.

Male scarcely half as large, pencil of antennæ glossy white.

[a] The measurements are all in decimal parts of an English inch.

Ula. *(e Tipulariis rostratis. Meig.)*

Antennæ porrectæ; 17-articulatæ; articulis 2 baseos brevibus crassis, reliquis oblongis, subæqualibus: palpi incurvi quadri-articulati, articulo ultimo longiore: alæ incumbentes pubescentes.

U. mollissima.

Head cinerous yellow: 2d joint of antennæ yellow, the following 15 brown, pubescent, with a long hair about the middle of each: palpi long, pubescent: 2d joint thickest, the rest increasing in length and diminishing in thickness, the last as long as the 2 preceding: thorax dull yellow, clothed with loose scattered hairs: poisers pale brown: abdomen and feet brown, pubescent: base of thighs yellowish: wings brownish cinereous, with a faint purple line dividing the anterior long cell of the disk, the whole surface thickly clothed with fine hairs: nervures disposed like those of *Limnobia immaculata*, but the two forked ones of the margin are here replaced by three simple nervures, proceeding from a small middle cell as in *L. pictipennis*. (Length .23; antennæ .1; exp. .58.)

A single male taken in a shady spot by a rivulet the beginning of October.

Limnobia decora. *Cinerea; thorace fusco lineato, abdomine silaceo, alis antice testaceis macula punctisque costæ hyalinis.*

Belongs to division C. resembling *L. fasciata*, but the ground colour of the wings is pale brown, only the costal spots being whitish hyaline, the nervures of the posterior portion are bordered with testaceous. The general disposition of the markings may be derived from that of *L. fasciata*, supposing the testaceous colour diffused along the anterior half, and the spots on the nervures of the rest to become irregularly confluent.

L. senilis. *Lurida: abdomine, antennis, pedibusque fuscis, alis obscuris.* (Long. .2; dilat. .46.)

The neuration nearly as in division F. (*L. nemoralis, &c.*) but the middle cell is smaller, producing both the anterior nervures from its anterior angle, and the fork of the first is nearer to the margin. Resembles *Ula mollissima* in general character, but the short antennæ and palpi are like others of the Limnobiæ. Colour of the wings as in that species, and their surface pubescent: base of the thighs yellowish.

Common in shady spots in autumn.

L. demissa. *Fusco-cinerea; thorace trivittato, alis stigmate fusco.* (Long. .3; dilat. .7; antennæ, ♂ .12.)

Wings as in division U. (*L. immaculata*) but the subcostal nervure is connected with the 1st of the apex by *two* transverse nervures, and the first branched one of the margin has a shorter fork: antennæ of 13 joints longer than in *L. immaculata*: in the male the antennæ are twice as long, with very distinct oblong compressed joints: the antennæ, feet, and abdomen are dusky: legs longer than in *L. immaculata*.

L. pavida. *Obscure flavida: thorace trivittato, antennis fuscis, alis hyalinis, stigmate pallido.* (Long. .26; dilat. .6.)

Wings as in the last; but the first of the two nervures that are forked in that, is in this unbranched; the nervures are delicately pubescent: the wings hyaline, with a very pale brown stigma: the form slender, as in *L. tenella*: the legs long and slender: the borer of the female reddish.

Dicranomyia oscillans. *Flavido-cinerea; dorso obscurius, alis cerulescentibus, nervis fusco limbatis, maculis tribus costæ distinctioribus.* (Long. .28; dilat. .68.)

First joint of the antennæ, and the legs, are pale yellow, the ends of the thighs and shanks dusky: the back of the prothorax and of each humeral lobe brownish: wings bluish hyaline: the nervures, as in *D. chorea;* but the 1st longitudinal springs nearer the base, all are very delicately pubescent; those of the margin, the transverse, and the 3d longitudinal, are bordered with brown: the stigma diffused brown, produced backwards, as in *D. chorea*, another spot surrounds the origin of the 1st longitudinal nervure, and a third is placed at an equal interval along the subcostal nervure, the portion of which within the spots are nearly black.

I found this species abundantly on the ascent of Sliebh Donard, resting on the underside of rocky masses in the shade, swinging itself constantly on its long legs as a carriage on its springs. It has also occurred at Holywood.

GERANOMYIA. (*e Tipulariis rostratis. Meig.*)

Antennæ 14-articulatæ: articulo 1° cylindrico, 2° cyathiformi, reliquis globosis decrescentibus: proboscis porrecta, rigida, longitudine thoracis, ante medium palpigera: palpi brevissimi exarticulati: alæ incumbentes parallelæ: oculi subtus contigui.

G. unicolor.

Resembles a *Dicranomyia* in figure: the cylindrical rostrum is longer than the head: the palpi are inserted under its lateral margins, consisting of one minute ovate-conic joint: the tongue and lip are elongated into a rigid slender proboscis, twice as long as the rostrum: the lip terminates in two slender flattened lobes applied to each other, and containing between them the tongue, as fine as a bristle, and admitting of being pushed out a little. (The whole apparatus has a very blood-sucking appearance.) The eyes are separate on the upper side of the head: the thorax is glossy brown, immaculate, with very deep sutures: the incisures of the abdomen darker, borer reddish: poisers, legs, and proboscis, pale yellowish: antennæ and rostrum dusky: wings bluish: the nervures finely pubescent, disposed as in *D. chorea:* subcostal pale yellow, with two short dusky lines, placed as those included in the costal spots of *D. oscillans*. (Length from tip of proboscis, .32; expans. .66.)

Taken among the rocks near the harbour of Donaghadee; middle of July, 1832.

Trichocera fuscata.

Was produced from putrescent fungi. October.

Tipula gigantea.

Some years back was common here, but has now disappeared.

Tipula dispar. *Cinerea; antennis pedibusque nigris, pedicello et coxis luteis, alis obscuris immaculatis.* Mas. *Thorace bivittato.* Fem. *Alis thoracis longitudine.* (Long. .5±.)

Antennæ of the male longer than in *T. oleracea;* the second joint yellowish: rostrum and palpi shorter: legs slender, the feet longer than the shanks, extreme base of thighs yellowish: poisers bright reddish ferruginous: wings without a stigma, nervures dusky, at the base yellowish, the second entering the middle cell a little behind its central line: the female has short and thick antennæ and legs: wings contracted, very short, but with distinct nervures: poisers darker: thorax dusky on the back: borer yellowish ferruginous, rather thick and bent.

Appears after the autumnal equinox; the female generally on the short grass in plantations.

Sciophila pictipennis. *Ferruginea: abdomine postice nigro-fasciato, alis hyalinis, fasciis, duobus sinuatis fuscis.*

(Belongs to division B.) Smaller than *Leja Winthemi:* the 3d and 4th segments of the abdomen dusky at the base, the 5th and 6th nearly black: spines of the legs very delicate: 1st band of the wings comprehending the areolet, and diffused along the thinner margin, 2d before the apex, scarcely reaching to the margin.

Taken in Devonshire.

Mycetophila lunata, M.

The larvæ gregarious in the growing stems of hollow stalked agarics, spin for their transformation a long pouch of white silk with a flat circular lid.

Myc. lunata, F.

Differs much from the *lunata* of Meigen: is more like his *M. distigma*, but wants the black bands of the thorax.

Is not common here.

Orphnephila devia.

At all seasons of the year about shaded brooks. A dull timid creature, very unlike the active insects belonging to the section *fungicolæ*.

ANARETE. *(e Tipulariis Gallicolis, M.?)*

Antennæ breves, 9-articulatæ, articulis 2 baseos majoribus: oculi emarginati: ocelli tres: alæ incumbentes nudæ: nervus furcatus costæ mediæ insertus: tibiæ ecalcaratæ.

A. candidata. *Tipula Pini. De Geer?*

Glossy black: the wings pure white: legs pale, hind shanks and feet white; legs of the male much longer: nervures colourless, except the 2 subcostal, which are rosy, in newly disclosed specimens: nearly as large as *Lestremia leucophea*, from which it differs principally by the antennæ: the wings are alike in neuration.

CATOCHA. *(e Tipulariis Gallicolis, M.)*

Antennæ porrectæ, articulis 2 baseos crassioribus, *maris* 16-articulatæ articulis globosis remotis plosis, *feminæ* breviores 10-articulatæ: ocelli tres: alæ incumbentes pilosæ: nervus furcatus prope basin, costæ insertus.

C. latipes.

Glossy black, with dusky yellow legs, and darker tarsi: the fore pair

in the female have the last 4 joints dilated ovate, successively diminishing: wings greyish, hyaline: resembles a *Campylomyza*: the wings are of the same form, and the subcostal nervures even so disposed, but the inner is curved backwards at the transverse nervure, and emits a forked one to the margin, and the hind forked one of *Campylomyza* is replaced by two separate simple ones.

Cecidomyia annulipes.

Meigen's description must have been made from a rubbed specimen. In mine the wings are bluish, with annular rosy spots, appearing in oblique lights, the whole disk clothed with grey down: the tip of the wing has a small velvety spot of a cream colour.

Scatopse B.

Metatarsus posticus *maris* haud abbreviatus, antennarum articuli tres apicales arcte connati.

S. infumata. *Nigra, holosericea, alis fuliginosis, halteribus nigris, tibiis antice albis.* (Long. .075.)

Bibio leucopterus.

Female glabrous black, with slender legs, otherwise like the female of *B. Marci*.

Occurs at Coombe Wood: also about Holywood.

B. nigriventris. Fem. *Nigra; pedibus rufis, alis fusco-nervosis, stigmate nigro.* (Long. .26.)

The male being unknown, the specific character cannot be fully drawn up. It most resembles *B. fulviventris*, with which it agrees in the length of the legs, the distinct nervures, and black stigma: it is smaller, with black body and rufous legs: it appears about a fortnight later than *B. Johannis*, for which it seems to be commonly mistaken.

B. hybridus.

Half the size of *B. lanigerus* ♂, with which it agrees in general character, wings, and colour; but the pubescence is more scanty and black, except on the abdomen, where it is somewhat pale: that of the thighs is yellow, in *B. lanigerus*: from *B. ferruginatus* ♂, it differs by the finer pubescence, more obsolete stigma, rather shorter tarsi, and ferruginous tibiæ.

B. varipes ♂.

Taken at Bexley in the summer, when most of the other species had long disappeared.

B. clavipes.

Is abundant in the autumn throughout Ireland. All the females I have taken have the legs more or less red or pale; a character unnoticed by Meigen.

Cyrtoma.

This genus should come next to *Ocydromia*, from which it differs little in the trophi, &c.

Cyrtoma melæna. *Nigra, alis hyalinis, tibiis posticis gracilibus.*

Size of *C. atra* and *nigra:* the hind shanks longer than in either, and very slender: the wings whitish hyaline ♀.

Rare about Holywood.

Trichina clavipes.

Rare about Holywood; common in Wicklow.

T. elongata. *Gracilis, nigra, nitida, pedibus fuscis.*

Half the size of *T. clavipes*, but as long, the abdomen of the female being very much produced and pointed: legs slender: in the male the hind shanks are somewhat clavate: in the female the fore thighs are pale, as well as the base of the others and of the shanks: wings with a light brown stigma: thorax of the male bronzed.

Rare; generally on larches.

Hilara matrona. *Nigricans; alis fumatis, halteribus et femoribus luteis, metatarso antico* maris *dilatato elliptico, margine ciliato.* (Long. .22; dilat. .53.)

Larger than *H. cilipes:* fore legs of similar structure: coxæ, thighs, and half of fore shanks, as well as the base of the rest, dirty yellow: wings with an oblong costal spot of deeper colour.

Taken beside a mountain torrent, flowing to the upper lake of the Churches.

HEMERODROMIA.

A: *Alis nervo transverso apicis: seta antennarum brevissima.*

H. melanocephala. *Flava: antennis palpisque concoloribus, capite griseo, abdominis dorso fusco, alis immaculatis, nervis disci transversis tribus.* (Long. .15.)

Empis melanocephala. *Fabr.* E. S.

The size of *H. monostigma:* the wings as in it, except that the second nervure is not rounded at its termination, and does not include any

stigma: face white: thorax with a light ferruginous line down each side: tip of the abdomen, and the whole under side, pale yellow.

A rare species, inhabiting woods. Holywood, and the vale of Clara.

Heleodromia. *(e Fam. Tachydromiarum, M.)*

Caput orbiculatum transversum, fronte lata, hypostomate lineari: antennæ porrectæ, articulo primo minuto 2° globoso, tertio infundibuliformi seta apicali: pedes graciles: coxis anticis elongatis: alæ incumbentes parallelæ, areola media completa.

A. *Proboscis perpendicularis, capite longior, palpis brevibus incumbentibus.*

H. immaculata. *Cinerea: antennis pedibusque nigris, alis ferrugineis immaculatis.* (Long. .1.)

Wings as in *H. bipunctata*, but without the oblique apical nervure: hypostoma narrow silvery: front and thorax inclining to ferruginous: poisers yellow, the tip dusky: hypopygium of ♂ reflected ventricose.

In woods; rare.

B. *Proboscis brevis crassa subexserta: alæ nervo obliquo apicis.*

H. bipunctata. *Cinerea: vitta dorsali fusca, pedibus testaceis, alis stigmate fusco.* (Long. .12.)

Wings narrower than in the next, the oblique apical nervure longer, and the middle cell narrower, and nearer the base: obscure, with a brown dot beyond the middle of the rib: hypostoma narrow silvery: antennæ black, thorax with a dusky stripe down the middle, sides pearly grey: poisers dusky.

About ditches in summer; very rare.

H. stagnalis. *Olivacea, subtus schistacea, genubus rufis, alarum nervis transversis infuscatis.* (Long. .16.)

Hypostoma silvery: antennæ black: front and thorax olive: back of the abdomen blackish, indented at the sides by grey spots: underside slate colour, the thighs glossed with the same: nervures of the wings as in *Brachystoma, Meig.* *Brachystoma longicornis* also resembles the present genus in its elongate fore-coxæ, but by its antennæ it belongs properly to the preceding family (*Empidæ*).

Inhabits duck-meat (*Lenma*) on the surface of ponds early in the spring, skipping very actively in small troops, and scarcely to be taken without sweeping up the surface of the water.

H. fontinalis. *Olivacea, subtus schistacea, thorace vittato, pedibus luridis, alis obscuris maculis tribus testaceis.*

Size of the last, which it greatly resembles: hypostoma silvery: antennæ black: legs dark red: fore thighs at the base dusky, glossed with grey: beneath their apex in the male is a tuft of hairs: front and thorax deep olive, the last with two chesnut stripes, divided by a pale line: underside slate grey: the blackish indented band down the back of the abdomen is narrower than in the preceding: hypopygium as in the last reflected forcipate, with a long bristle rolled up spirally at the end: wings dusky, the rib and nervures of the tip bordered with a deep tinge: the small transverse nervures of the base bordered with deep brown: another spot surrounds the fork of the apical nervure, and a third includes the ordinary transverse nervure: these markings are rather diffused and cloud-like, but deeply coloured.

Inhabits the shady beds of small rivulets in summer, but is rare.

LEPTOSCELES. (*Genus Heleodromiæ proximum.*)

Caput nutans, ellipticum: oculis magnis, ovatis, approximatis: hypostoma lineare attenuatum: proboscis brevis crassa palpis incumbentibus: antennæ articulo primo minuto, tertio ovato compresso: apice seta longissima: pedes graciles: coxis anticis elongatis: alæ incumbentes areola media completa.

L. guttata. *Nigra, nitida, linea dorsali albomicante, alis fuscis, postice albo guttatis; pedibus testaceis.*

Hemerodromia irrorata. *Meig.* III. T. 23. Fig. 11. *ala.*

Face silvery: thorax brassy, with a glossy white line down the middle, and other markings at the sides and in front: nervures of the wings nearly as in *Heleodromia stagnalis;* but the oblique apical nervure is connected with the preceding by a small transverse one, and the wings are narrower at the base; their colour varies from dusky cinerous to deep ferruginous: the costal margin has no spots: between the forks of the apical nervure is a round white spot, two more between the 3d and 4th longitudinal, and one between the 4th and 5th near the margin; these 4 are placed in a lozenge form: the remaining spots of the hinder area are less conspicuous. (Length .12.)

This little insect is to be found on grass throughout the summer; but is difficult to capture, flying off as soon as it is in the net.

L. irrorata. *Nigra, nitida, thorace olivaceo-pruinoso, linea dorsali albomicante, alis fuscis, albo guttatis et tesselatis, nervuris undulatis, pedibus testaceis.*

Tachydromia irrorata. *Fall. Empid.* 13, 17.?

Size of the last, inhabiting the same situations, but more common: the thorax is opaque, with more evident white markings: wings dark ferruginous, the base yellowish, the intervals between the 1st, 2d, and 3d nervures, and the oblique one of the tip, are chequered with large white spots: the rest of the wings, except the portion of the disk between the 3d and 4th, more faintly marked with small irregular dots.

L. exoleta. *Nigra, nitida, alis cinereis.*

This may be a variety of *L. irrorata*, as the wings in some lights appear very faintly spotted: the nervures are not undulate: the thorax is opaque black, without apparent markings (probably discoloured): a single male with the others.

Tachypeza umbrarum. *Nigra, nitida, antennis pallidis, alis fasciis 2 fuscis, antice subconnexis.*

The bands of the wings are connected by a very narrow line along the costa: the joints of the legs are pale, the middle shanks end in a produced sharp tooth.

T. arenaria. *Nigro-fusca, opaca, alis abbreviatis, fuscis, pedibus brevibus, rufo piceis.*

A singular insect, not arranging well either with this genus or with *Drapetes:* the body is coriaceous and opaque, the wings not longer than the abdomen, but with distinct nervures, nearly as in *Drapetes:* the costa thick; they are useless for flight: abdomen of 8 segments: feet very short for this family, coriaceous, unarmed, fore thighs thick, ovate, fore shanks clavate: proboscis thick, conical, inflected to the breast: antennæ with the second joint compressed, orbicular, much larger than the third: seta 2-jointed pubescent.

Inhabits sandy coasts under marine rejectamenta, running with extraordinary swiftness. Taken at Midsummer; did not occur late in autumn.

T. graminum.

This is probably congenerous with the last, which it resembles in the

short body, thick legs, wings unfit for flying, &c.: the antennæ have the first joint so minute as not to appear; the second very large, orbicular, with a bristly top: obliquely on its outer side is inserted the very minute third joint, terminating in a long seta, reflected towards the sides of the breast.

Taken in swampy spots about Bexley.

Opitia nigra.

The males are common in September; the females rare.

O. lonchopteroides.

The specimen not being before me, I defer the description of it.

Pipunculus modestus. *Ater opacus, abdominis maculis, lateralibus cinereis, antennis acuminatis.* Fem.

Front silvery, above glossed with black: antennæ black: knees and base of fore feet yellowish: hypopygium of ♀ short, globular, with a blackish spine: spots of the abdomen triangular, almost meeting in the middle: half as large as *P. campestris*. (Belongs to division A.)

Taken in Kent.

P. exiguus. *Cinereus, alis hyalinis, pedibus fusco-pallidis, halteribus albis.*

(To division C.) One half smaller than *P. spurius* (of which it may be the female, as I have only males of that species, and the colour and wings of the sexes differ greatly in this genus): obscure cinerous, with pale poisers: wings hyaline, with a faint brown costal spot: legs dusky yellow, thighs and middle of hind shanks brown.

Spania Fallenii. *Nigra, alis denigratis, antennarum articulo tertio lineari elongato.* (Long. .12.)

Agrees with the description of *S. nigra*, except in the antennæ, which are entirely different: the third joint is longer than the head, elongate linear: the base a little thicker: the remaining portion flattened and curved outwards, the tip suddenly and obliquely attenuate, probably the insertion of a small style (but if so, it is concealed by the close pubescence, as well as the articulations of the flagellum, if any). The place of this genus is undoubtedly wrong in Meigen's work; but whether it belongs to the *Rhagionidæ*, or rather to some of the neighbouring families, I cannot

positively say, without a more detailed examination than I have materials for, possessing only a pair, and the fragments of a third wanting the head. These were all taken at Holywood, about eight years since. The trophi are prominent, with fleshy lips, and long exserted linear palpi. A single *Spania* occurred this summer near the waterfall in the Devil's Glen, but as it escaped from me, I cannot identify the species.

Medeterus alpinus. *Nigro-æneus, pedibus ferrugineis, alis fuliginosis plagâ hyalinâ, hypostomate argenteo.* Mas. *Oculis confluentibus, alis intus angustatis.*

(To division B.) A minute species, half the size of *M. curvipes*: mouth prominent, silvery: eyes of the male contiguous, of the female divided by a very narrow line: front steel blue: body metallic, greenish black: legs ferruginous, thighs above with a dusky line, feet brown: wings dusky black, the disk whitish hyaline, transverse nervure and a dot on the 4th dusky. In the male the wings are much narrowed from the 5th nervure to the base, the tip is more determinately coloured, and the nervures suffused with black.

Near the summit of Sliebh Donard, upon spots of black springy peat; elevation nearly 3000 feet. In moory uplands of Wicklow.

Porphyrops riparius.

The *male*, described under this name in the 19th number of the Zoological Journal, is the other sex of *P. rufipes* there mentioned as a native; but as it does not exactly accord with Meigen's description of the *male* of that species, the synonym may be doubtful.

P. pumilus.

The *males* of this and some cognate species, have no spine on the hind metatarsus: my divisions A and B, should be re-united as they stand in Meigen, (and probably the genus *Rhaphium* reduced to the same;) but *P. flavicollis* seems to differ from the rest by its reflected hairy palpi, &c.

Dolichopus jucundus. *Viridi-æneus, incisuris nigris, antennis basi rufis, coxis anticis pedibusque pallidis, tarsis apice nigris, alarum nervo quarto rectangulatim fracto.* Mas. *Femoribus imberbibus, lamellis longius ciliatis.*

Resembles *D. nitidus* (Fallen), but the third joint of the antennæ is shorter and blunt, black at the end, the rest ferruginous with a

dark line above: face silvery: wings broad, in the male more hyaline, with a minute costal line as in that species: the hind tarsi are pale at the base: the lamellæ are fringed with longer hairs.

Inhabits marshes near Holywood. August.

D. linearis ♂.

Resembles *D. acuticornis*, in the form of the wings and all other characters, except the short antennæ: very rare.

D. plumipes. *Thorace ferruginoso, antennis rufis, apice nigris, tibiis et metatarsis anterioribus rufis, alis puncto nervoque transverso fuscis.* Mas. *Articulis 4 ultimis tarsorum articorum brevibus latissimis nigris, candido micantibus.*

D. litoreus. *Thorace ferruginoso, antennis basi subtus, tibiisque rufis, alis puncto nervoque transverso fuscis.* Mas. *Articulis quatuor ultimis tarsorum anticorum crassioribus ultimo albo micante.*

D. plumipes. H. *in Zool. J.*

These two species agree in all particulars but the following; the 4th longitudinal nervure is slightly bent at the dusky spot, and the transverse sinuate in the first, which has also the antennæ, and shanks of a brighter red: the fore metatarsus of the male is long and rufous, the following joints very broad, the end of the shanks and all the joints of the feet glossed with pure white: in the other the fore metatarsus is black, rather short, and incrassate at the end, the remaining joints are not nearly so broad as in *D. plumipes*, the last only with a dull whitish gloss: the antennæ have only a very obscure red spot on the underside of the first joint; and the red colour extends over a smaller portion of the thighs.

D. litoreus is not rare on the sea-coast; *D. plumipes* in the moory uplands of Wicklow.

D. rupestris. *Obscure æneus, femoribus posterioribus, tibiisque ferrugineis, alis intus subrotundatis obscuris.* Mas. *Femoribus imberbibus, tibiis posticis medio constrictis.* (Long. .16.)

Colour darker than in *D. campestris*: face obscure sulphureous; in the female almost grey: whitish above the mouth: coxæ black: thighs ferruginous, fore pair almost to the tip, hind only at the ends, dusky: tips of hindshanks and the feet black, the shanks

thicker before the middle in the male, but less conspicuously than in *D. pennatus :* wings as in *D. fuscipes,* but the 4th nervure is less curved ; the 1st terminates in a black costal dot in the male.

D. campestris. Mas. *Femoribus posticis, nigro-pubescentibus, lamellis fuscis.*

Face sulphureous : lamellæ, below fringed with whitish down, and long black hairs at the tip : the rib of the wing has no incrassate line or dot : the hairs on the hind thighs are very short.

D. patellatus. Mas. *Femoribus imberbibus.*

Very rare ; no females taken.

D. urbanus.

The dusky wings are a character of the species.

Pipiza interrupta. *Obscure ænea, antennis capite longioribus, genubus ferrugineis, alis hyalinis, nervurâ transversâ apicis abruptâ.*

Half the size of the small variety of *P. virens* which it resembles, but the body is much less pubescent, and the front and face have only a few very inconspicuous greyish hairs : third joint of the antennæ more oblong than in that species.

Taken at Tullymore Park in August 1831. (To division B.)

Musca Chloris. *Viridi-ænea, frontis vitta nigra, palpis nigris, hypostomate et antennis albidis.* (Long. .27.)

(To the division *Nobiles.*) Smaller than *M. Cæsar,* the angle of the fourth nervure less acute: the cheeks are darker than the rest of the body : the front is tolerably broad in the male, much broader in the female, with a deep black stripe, coppery, round the eyelets : the front is clothed with soft hair and not with bristles : the 3d joint of the antennæ is glossed with dull white : this is with us the most common of the *Muscæ nobiles,* but seems to be undescribed.

Musca degener. *Nigricans, abdomine cinereo tesselato, palpis nigris, antennis basi rufis.* (Long. .3.)

Resembles *M. rudis,* but is smaller, and the thorax without ferruginous scales: the antennæ always ferruginous or reddish at the base.

Common in Autumn.

M. macellaria. *Nigricans, palpis ferrugineis, abdomine olivaceo.* (Long. .26.)

Wings, as in *M. rudes:* head grey, with a broad black frontal stripe: antennæ black: thorax in front with greyish reflections, but not in distinct lines: abdomen brassy olive, with greyish reflections in the usual place.

Lispe litorea.

More common on the sea-coast than *L. tentaculata;* the middle feet of the male are very short.

L. adscita. *Cinerea, thorace vittis, abdomine maculis nigricantibus, fronte aterrimâ maculâ acuminatâ candidâ.*

Differs from the characters of the genus by the naked seta, and the linear palpi scarcely thicker at the end: the face is most brilliant silvery white: the antennæ in the male as long as the face: the whitish triangle of the vertex is produced to the base of the antennæ, and in front is silvery white: thorax blackish, with very obscure cinereous lines: the sides slate colour: the abdomen is flat ovate, with a blackish triangular spot on each side of the second and third segments, leaving a grey line down the middle: the fourth segment is grey, with a blackish spot: legs black, with long slender tarsi, the middle pair very long: wings hyaline: the transverse nervure straight and perpendicular. (Length .22; exp. .41.)

In the female, the antennæ are shorter than the face, with the third joint obliquely attenuate: the triangle of the vertex is dull white, not reaching to the antennæ: the black front is bordered along the eyes with straw colour: the thorax is cinereous, with three broad and very conspicuous blackish stripes: the scutel blackish at the sides: abdomen as in the male; the last segment has only a narrow black line: legs scarcely shorter than in the male. (Length .26.)

Though not perfectly agreeing with Lispe, this species has more similarity in general form and character to this than any other genus. The hypopygium of the male is more thickened; but not inflated as in *Cœnosia.*

Schoenomyza.

Os mystacinum: oculi æqualiter remoti: antennæ basi approximatæ, apice devaricatæ, subdeflexæ, articulo tertio oblongo obtuso, basi seta dorsali nuda: abdomen quadriannulatum, pilosum: alæ incumbentes parallelæ, nervo transverso apicis nullo.

This genus may be known from *Cœnosia,* which it most resembles, by the incumbent antennæ and inflated hypopygium

of the latter. The two species referred to it are minute, and have been placed by Miegen far apart, in two genera to which they have little affinity. Both occur on the sea-coast at Holywood, but are not common.

Dryomyza mollis. *Pallide ferruginea, tomentosa, antennis apice tarsisque fuscis, alis hyalinis.* (Long. .36.)

Probably an immature variety of *D. flaveola.*

Coelopa.

A.—*Thorax depressed, coriaceous, with three impressed lines.*

C. frigida.

Fore metatarsus of ♂ toothed at the tip, below as in all the rest: the face and legs are clothed with soft dense fur without any bristles.

C. gravis. *Fusca, antennis ore pedibusque ferrugineis.* Mas. *Tibiis et metatarsis intermediis nigro villosis.* (Long. ♂ .3, ♀ .25.)

Front face and legs bristly: middle metatarsus concave, and as well as the shank, clothed with very long woolly black hair: fore metatarsus ending below in a blunt tooth. Female half as large: legs less bristly.

Abundant with the last on marine rejectamenta, upon sandy coasts, and equally so in the flowers of orchards.

C. simplex. *Fusca, antennis ore pedibusque ferrugineis.* Mas. *Tibiis et metatarsis intermediis subnudis.* (Long. ♂ .25.) Female smaller.

In the same situations with the last, and like it in other respects, but the characters of the male seem constant: the legs are less bristly: the metatarsus of the middle pair not arched, &c.

C. parvula. *Nigra, antennis basi ferrugineis, pedibus piceis.* (Long. .17.)

Thorax not so opaque as in the two preceding, the impressed lines very faint: legs less bristly.

Inhabits rocky coasts.

B.—*Thorax convex, soft, pubescent, without impressed lines.*

C. sciomyzina. *Pallida, tomentosa, vertice et thorace cinereis.* (Long. .17.)

Pubescence very thick and soft on the abdomen and legs: the middle shanks and metatarsi in the male, within, clothed with longer black hairs; and the fore metatarsus terminates in a smaller tooth than in the others: tips of fore shanks and the feet dusky: wings hyaline with yellowish nervures.

Var. β.—Smaller: the back of the abdomen dusky: the anus pale: legs clouded with brown: middle shanks and metatarsi of male scarcely bearded: pubescence not so dense. Probably a distinct species.

Inhabits marine rejectamenta.

Actora buccata.

Heteromyza buccata, Fallen; but does not agree with that genus, the mouth and legs being without bristles, and thickly clothed with soft furry down as in *Actora Æstuum*. (*Helcomyza ustulata, B. E.* 68.) From that species it differs in having the face rather less perpendicular, the 2d joint of the abdomen proportionally shorter, and the rib of the wing destitute of bristles, characters, I think, quite insufficient to separate generally two species so allied in habit.

Heteromyza oculata. *Fall.*

Male, eyes large, approximate, fiery: front linear rufous: face pale rufous: antennæ black: thorax dull black, beneath grey: abdomen linear, rufous, villous: legs long, rufous: fore thighs dusky: wings blackish, the interval between the 1st and 2d costal nervures yellowish: about the middle of the rib are a few minute bristles.

Female, front of the usual breadth, rufous: occiput and margin of the eyes cæsious: thorax behind light grey, before blackish (discoloured?): abdomen rufous, not villous: wings as in the male, but without the yellowish space at the rib: legs not so long. (Length .26.)

Helomyza ustulata?

Female, ferruginous: abdomen, with a hoary tinge, and narrow blackish incisures: transverse nervures, and three spots at the clip of the wings, dusky; these spots are not produced into the disk or connected as in *H. ustulata:* third joint of the antennæ elliptic, with the seta delicately pubescent (Length .26.)

Tetanocera vittata. *Ferruginea, vittis, frontis luteis, thoracis canis, alis fusco-cancellatis.* (Long. .19.)

(To division A. h.) Front not much produced, orange, with the margin of the eye and the glossy middle stripe ferruginous: occiput

with two glossy white spots: antennæ short, ferruginous; third joint obtuse, black: seta black, feathered with long hair: face pale yellow: thorax glossy ferruginous, with three pearl grey lines down the back, separated by two of a deep chesnut; down each side a less distinct grey band: scutel dark in the middle: abdomen darker above except at the tip: legs yellow, ferruginous: fore pair brown, except the base of the thighs and shanks: wings obscure iridescent, yellowish at the base: the transverse nervure straight and perpendicular, and all the nervures bordered with deep brown.

Tetanocera cucularia, β.

The front has no black spots; on the back of the head is one dark, one bordered with white: the thorax is not grey, but yellowish ferruginous, with four deeper bands: wings yellowish, with markings deeper than in *Var.* α, but similar in disposition.

Var. γ.—Colour of the body as in *Var.* β; the wings hyaline with very faint markings.

Piophila luteata. *Nigra, nitida, capite pleuris pectore pedibusque posterioribus luteis.*

More robust than *P. Casei;* the legs shorter and thicker: back of the thorax, scutel, and the entire abdomen, shining greenish black: fore legs blackish, with the knees and base of the shanks yellowish: hind thighs and shanks with brown rings, tips of the feet dusky: wings shorter than in *P. Casei*, yellowish, with thick yellow nervures.

Pandora.

Antennæ incumbentes, articulo tertio elliptico, compresso; seta dorsali nudâ: hypostoma subdescendens foveolatum mystacinum: oculi rotundi remoti: frons lata glabra setosa: abdomen oblongum, depressum, glabrum, 5-annulatum: alæ incumbentes (erectæ vibrantes.)

The wings differ much from *Piophila*, are small and narrowed to the tip, with the 3d and 4th longitudinal nervures there approaching; the 4th is not continued quite to the root of the wing, but curved to meet the 5th; the first is double, with the branches entirely separated, as in *Ortalis*, and neither merging in the costa as in *Piophila:* the face is more convex, the antennæ reposed in deep foveolæ: the legs long and thicker than in *Piophila.*

P. scutellaris. *Piophila scutellaris. Fall.*

P. basalis. *Nigra, nitida, hypostomate, antennis basique pedum luteis.*

Half the size of the preceding: glossy black: wings hyaline, nervures light brown, yellowish at the base: the long fore coxæ, all the trochanters, and the base of the hinder thighs yellow: face, mouth, and antennæ yellow-ferruginous, tip of the last brown.

Sepsis. B.

S. putris. *Nigra, nitida, pedibus concoloribus.* Mas. *Metatarso antico brevi incrassato, hypopygio breviùs setoso.*

Fore thighs with a strong tooth and spines beneath, the middle of the fore shanks within emarginate, with a flattened brown tubercle: the tufts of curled hairs on each side of the hypopygium are not half as long as the abdomen.

S. superba. *Nigra, nitida, pedibus concoloribus.* Mas. *Metatarso antico longissimo, hypopygio longiùs setoso.* (Long. .125.)

Half as large as the preceding, and very like it: the fore thighs are twisted and armed below with four spinous teeth in a cluster: the fore shanks are deeply notched, with a strong tooth on the inner side; above this a spine, a small tooth nearer the base; before the tip on the outer side is a long spine: the fore metatarsus is very long and straight, the next joint is the shortest: the tuft of hairs on each side of the hypopygium is as long as the abdomen.

The male of this very distinct species was taken near Holywood, and again in Wicklow.

S. minor. *Nigra, nitida, pedibus concoloribus.* Mas. *Tarsis simplicibus, hypopygio nudo.*

Varies from one-half to one-fifth of the size of *S. putris*: fore thighs of the male have a few bristles below: the fore shanks have a bifid spine about the middle.

Occurs in company with *S. putris*, and is often almost as common.

Tephritis Plantaginis. *Flavido-cinerea, capite, scutello, pedibusque, fulvis, alis ferrugineo-reticulatis maculâ costali geminatâ nigra.* (Long. .22.)

Borer of the female black-brown: wings reticulate with ferruginous, outwardly the ground colour is ferruginous, with circular white spots; about the middle of the rib two black spots divided by a white one: the transverse nervures are approximate; in three portions of the wing, the proportion of the dark colour is greatest,

sometimes appearing as three tolerably defined spots; the double costal spot forms the nucleus of one, another larger embracing the whole tip of the wing, the third surrounding the ordinary transverse nervure.

This species occurs on the sea-coast, in spots overgrown with *Plantago maritima*.

T. Centaurea and *T. Onopordinis* are one species, all intermediate varieties occurring.

Lauxania amica. *Nigra, subænea, vitta frontali cupreâ, genubus tarsisque posticis fuscis, alis subhyalinis.* (Long. .14.)

Smaller than *L. cylindricornis*, with ferruginous antennæ (short as in *L. longipennis*), the seta scarcely pubescent: face glossed with dull white: above the base of the antennæ is a transverse line, coppery or reddish: the wings are entirely obscure hyaline, or with a very faint yellowish tinge.

L. longipennis, *Meig.* L. basalis, *Steph.?*

L. sordida. *Ferruginea, nitida, anticis femoribus apice tarsisque fuscis, alis luteis.* (Long. .2.)

Antennæ short as in *L. longipennis*, but the seta scarcely pubescent abdomen short, broad, and rounded, with scattered black hairs.

Phyllomyza.

Antennæ deflexæ, articulo ultimo oblongo compresso, apice obtuso, basi setâ, dorsali pubescente: hypostoma subdescendens planum nudum: oculi distantes rotundi: abdomen ovatum quinque-annulatum: alæ deflexæ nervo longitudinali primo duplicato.

1. Ph. litura. Sapromyza litura. *Meig.*
Inhabits oak trees; Tullymore park.

Heteroneura spurca. *Ferruginea, nitida, occipite bimaculato, alis apice nervoque transverso late infuscatis.* (Long. .17+.)

This species differs from the others in having the transverse nervures rather distant, the double subcostal nervure more obviously divided, and the face is a little more inclined inwards; but there is no other genus with which it can be so well placed: the third joint of the antennæ has a dusky spot above, the back of the head two large brown spots: the abdomen in the female ends in an arti-

culated style: the segments are darker in the middle: face and legs paler: wings yellowish, the tip and transverse nervure surrounded with brown.

The first longitudinal nervure in this genus is distinctly doubled, though the branches are generally very near each other: in general character it seems rather related to *Psila* or to *Palloptera* than to any of the genera near which it stands in Meigen.

Stegana annulata. *Nigra, nitida, alis fuliginosis, hypostomate pectore pedibusque pallidis, horum annulo nigro.* (Long .14.)

The tips of all the thighs and the base of the hinder shanks black.

Camarota aurifrons. *Nigra, pedibus luridis, thorace opaco punctato, fronte glabra lutea.* (Long. .1.)

Face pale yellow: antennæ black, the base ferruginous: front shining glabrous, except a single series of very fine hairs near the margin of each eye, the raised triangle is golden, the rest of the front deep orange: poisers dusky: wings brown: the fore legs, the ends of the shanks, and the feet, are lighter coloured than the rest.

Taken in oak copses near Bexley.

Meromyza viridula. *Elongata, dilute prasina; vittis thoracis tribus discretis, scutelli et abdominis unicâ nigris.* (Long. .22; dilat. .35.)

Elongate, the front more produced than in the rest (approaching to the genus *Eurina* in this respect), palpi immaculate, a black dot on the vertex: back of the head immaculate, or with two small reddish lines: stripes of the thorax separate, the middle one continued over the scutel, all with a greyish shade: dorsal line of the abdomen not extending to the base, a dot on each side of the same colour: breast with two pale ferruginous spots: legs immaculate green: wings hyaline, with green nervures.

M. variegata.

In the pair of this species which I possess, the ground colour is tawny yellow without any greenish tinge: the bands of the thorax are ferruginous, the metathorax and markings of the vertex and abdomen black: the front less produced than in any of the others.

Chlorops lateralis. *Straminea, triangulo frontali atro, thoracis abdominisque dorso antennisque nigris, pectore maculato.* (Long. .16.)

Head shaped as in the genus *Therina*, the face being concave, and the margin of the mouth sharply projecting; but the front and mouth are naked: head yellow, front more orange, triangle of the vertex very large, not touching the eyes, in front with a produced point almost reaching to the antennæ: disk of the thorax, scutel, and abdomen above greenish black not shining: the breast has two large black spots, and above these a chain of smaller ones running from the neck to the base of the hind coxæ: legs yellow, mottled with ferruginous: the thighs generally with an oblong spot, blacker in the fore pair; a faint ring round the hind shanks, and the tips of the feet dusky: poisers milk-white: wings hyaline with blackish nervures. (To division A.)

C. fulvifrons. *Nigra, nitida, pubescens, fronte et antennis ferrugineis, tibiis tarsisque fuscis.* (Long. .1.)

(To division A.) Size of *C. maura*: face a little impressed: triangle of the vertex extending to the middle of the front, black behind, in front passing into ferruginous: seta of antennæ pale, the base dusky: wings obscure hyaline, nervures yellowish brown, colourless towards the tip: poisers milk-white.

C. agnata. *Nigra, nitida, antennis pectore pedibusque ferrugineis fusco-variis, scutello flavo.* (Long. .12.)

Resembles *C. Cereris*, is smaller: the hypopygium is not inflated nor ferruginous: the base of all the thighs and a band round the hind shanks black, fore shanks at the tip, fore feet entirely, and the end of the rest dusky: the breast is more spotted and the front darker: the antennæ dusky at the tip. (To division A.)

Agromyza flavo-notata. *Nigra, scutello flavo.*

(To division C. a.) Perhaps a variety of *A. scutellata*.

Leucopis obscura. *Canescens, thorace immaculato, antennis pedibusque nigris, metatarsis posticis luteis.* (Long. .08.)

Half the size of *L. puncticornis*, colour dark grey: poisers cream-colour: on the vertex are a few bristles.

Notiphila madizans. *Fall.? Obscure ænea, abdomine opaco plano, antennis basi femoribus anticis pedibusque posterioribus ferrugineis.* (Long. .11; dilat. .18.)

Abdomen oblong and flattened, rugulose, first segment very short, almost concealed, 4th large, 5th minute: wings not longer than the abdomen, obscure, with the transverse nervure dusky: face whitish: fore shanks and feet black.

Not uncommon on grass.

Drosophila tristis. *Fall.*

The two first joints of the fore feet in the male are short and broad, with a black edge; the colour called by Meigen "testaceous" appears from many instances to be a different shade from that usually so named with us: in this insect it is almost a dull black: the brown tinge at the tip of the wing is not very remarkable: the eyes are fiery red: the abdomen, at least behind, is glossy black; but in all the females very soon after their appearance it becomes from distention black, with a pale band at the base of each segment, and I doubt not that the *Musca cellaris* of Linné, is the same, as his description agrees very tolerably with the female, while no one could call the tinge of *D. funebris*, black.

The present species is exceedingly abundant in autumn, and not uncommon throughout the whole winter and early spring.

D. ingrata.

Distinguished from the last by the broad and short hind shanks and feet.

Only one female taken.

D. melanogaster.

Fore feet of the male have the 1st and 2d joint dilated.

D. cameraria. *Thorace testaceo opaco vittâ fuscâ, abdomine rufo, incisuris fuscis.*

Resembles *D. fenestrarum*, but the opaque and more hairy head and thorax at once distinguish it.

In windows in autumn. Bred from Boleti.

Ephydra defecta. *Nigro-ænea, scutello violaceo nitido, alis obscuris hyalino-guttatis, antennis subtus luteis.* (Long. .08.)

(To division B.) Seta of antennæ pectinate: face silvery: semicircle of the vertex steel blue: markings of the wings nearly as in *E. noctula:* base of the metatarsi obscure yellow.

E. pygmæa. *Glauca, capite dorso prothoracis et scutello cinereis, antennis et tarsis ferrugineis.* (Long. .05.)

The face is not convex, but rather like a *Notiphila;* but the massive mouth and general character are more like *Ephydra:* antennæ with a dusky line above, third joint orbicular, seta short and pectinate:

poisers milk-white: feet dull yellow: wings obscure, the transverse nervure darker. (To division B.)

On the sea-coast.

E. fossarum. *Fusco-ænea, hypostomate æneo, pedibus nigris, alis fuscanis, nervis transversis obscuris.* (Long. .11; dilat. .26.)

(To division C. b.) Resembles *E. coarctata;* but the second longitudinal nervure has not the little branch: seta of antennæ pubescent: abdomen brassy green.

A very abundant species.

E. hecate. *Nigro-ænea, alis fuliginosis, nervis transversis obscuris utrinque hyalino guttatis.* (Long. .11; dilat. .22.)

(To division C. b.) Resembles the last; but the wings are much shorter and darker, at the end of the second nervure a dusky spot, and a distinct white one above and below each transverse nervure: the nervures of the tip bordered with brown: hind feet brown.

E. infecta. *Nigro-ænea, pedibus nigris, scutello chalybeo, alis obscuris, nervis transversis fuscis.* (Long. .08.)

(To division C. b. but the termination of the 2d longitudinal nervure is farther from the tip): wings greyish, transverse nervures clouded with brown, a hyaline spot above and below the inner: face cinereous: seta pubescent.

E. micans. *Obscure viridis, fronte violacea, antennarum seta subnuda, hypostomate candido.* Mas. *Aut flavescente.* Fem.

Size of *E. riparia;* but distinguished by the nearly naked seta and intense colour: face below the antennæ violet: thorax dark green with violet lines: abdomen of the male hoary green, of the female intense green with depressed tawny incisures.

E. sibilans. *Cinerea aut olivacea, capite thoraceque ferruginosis, hypostomate luteo, alis obscuris.* (Long. .11.)

(To division C. b.) Face convex, orange: antennæ black: seta finely pubescent: head and thorax with a ferruginous tinge, sides pearly grey: abdomen brassy olive: eyes brilliant green and coppery: legs black: transverse nervures darker: like *E. leucostoma*, but twice the size.

Early in the spring and summer, on the sea-coast. The other *Ephydræ*, except *E. curvicauda*, appear later.

E. æstuans. *Cinerea, capite thoracisque dorso ferruginosis, hypostomate luteo, alis cinereis (vel ferrugineis) macula punctisque albis.* (Long. .11; dilat. .3.)

(To division C. b.) Head very large, face convex, tawny yellow front ferruginous, generally paler in the middle: thorax opaque ferruginous above, generally with grey lines and spots, sides extending above the wings: scutel, metathorax and abdomen opaque grey: poisers yellow: seta of antennæ pubescent: markings of the wings placed as in *E. stagnalis*, but more conspicuous, and the spot between the 2d and 3d nervures is very large and square.

On marine rejectamenta; common in autumn.

E. paludum.

None of the species with similar markings have the wings so ample as the present.

F. lutosa. *Cinerea, capite thoraceque ferruginosis opacis, alis cinereis, guttis 5 hyalinis.* (Long. .09.)

Half as large as *E. stagnalis*, and constantly distinct: the thorax has no gloss or markings: the wings are lighter grey or ferruginous, the spots less evident: face yellowish.

I have seen yet another species with the wings similarly marked, but it does not occur about Holywood.

E. graminum. *Thorace cinereo punctis quinque pallidis, abdomine pedibusque nigris, tarsis flavis, alis cinereo-maculatis.* (Long. .08.)

Marking of the wings nearly as in *E. quadrata*, of which it may be a variety.

E. compta. *Nigro-ænea, abdomine pedibusque nigris, alis cinereis, albo guttatis, seta antennarum villosa.* (Long. .08.)

Markings of the wings as in *E. noctula*, and it may possibly not be distinct.

E. interrupta. *Thorace olivaceo fusco, vittato, abdomine postice nigro-nitido, hypostomate antennis tarsisque flavis, alis fuscis, disco hyalinis, nervis transversis infuscatis.* (Long. .1.)

(To division C. c.) Larger than *E. stictica*, which it resembles; the transverse nervures are much more approximate, and the dusky tip of the wings includes two deeper spots placed nearly as in *E. stictica*.

E. cesta. *Nigro-ænea, nitidissima, abdomine magno punctatissimo pubescente cyaneo.* (Long. .07.)

Head and thorax formed as in *E. rufipes*: seta villose above: abdomen very large and rather convex, 1st segment evanescent, 4th comprehending half of the entire, 5th minute deflected; the whole surface except the incisures deeply and coarsely punctured and pubescent: wings rather small, hyaline, nervure as in *E. rufipes*.

Neither this species nor *E. rufipes* agree well with the present genus; in some characters they rather approach *Notiphila madezans. Fall.*

Opomyza florum. Var.

Along the third nervure, between the transverse one and the tip, are from 4 to 7 dusky dots: the body is lighter coloured than in the common variety, and also smaller.

O. tremula. *Castanea, hypostomate antennis pedibusque flavis, thoracis dorso cinereo, abdomine nigro, alis basi apice nervoque transverso fuscis.* (Long. .15.)

More robust than *O. tripunctata*, the wings narrow and more pointed, the spots as in *O. bipunctata*: a spot on the hind thighs, and the base of the tibiæ are deep brown.

O. asteia. *Nigra, nitida, vertice concolore, capite abdominis basi pedibusque flavis, alis hyalinis.* (Long. .1.)

Form of *O. gracilis*: front face and antennæ ferruginous: seta naked: poisers pale yellow: thorax glossy greenish black.

Inhabits larch trees in autumn; rare.

Borborus pedestris.

Taken at mid-winter, on the banks of the Wandle, near London.

B. hamatus. *Nigro-æneus, nitidus, hypostomate nigro, alis ferrugineis, halteribus albidis.* (Long. .2+.)

(To division C.) Segments of the abdomen of nearly equal length: hind feet clothed with glossy yellow hair: 1st joint in the female shorter and dilated, 2d scarcely dilated; both in the male much broader, and the hind thighs at the base armed with a strong hooked tooth.

In woods; not common.

Division e. may be subdivided thus

† *Disk of the scutel glabrous, sides bristly.*

†† *Disk of the scutel pubescent or bristly.*

To C. † belong *B. sylvaticus—limosus—fenestralis?—clunipes—ochripes—zosteræ—nivalis;* and many more which it is difficult to distinguish.

To C. †† *B. fuscipennis—vagans, &c.*

B. nivalis. *Niger, hypostomate ferrugineo, alis abbreviatis.* (Long. .08.)

Dull black: face rusty yellow: legs rufescent: thighs and hind shanks dusky: 2d joint of hind feet twice as long as 1st, scarcely thickened: wings shorter than the abdomen.

About the roots of trees during the winter; leaping far.

B. Zosteræ. *Niger, tarsis luteis, alis denigratis, thorace scutelloque opacis planis, antennarum seta albida.* (Long. .06.)

Thorax with an obsolete depressed line down the back: scutel with only about two pair of bristles at the sides and tip: feet short, yellowish, 2d joint of the hind pair somewhat thickened: wings of an uniform opaque smoky tint: knob of the poisers deep brown.

Common upon Zostera, drying on the shore.

B. fuscipennis. *Niger, pedibus piceis, thorace scutelloque ferruginosis setosis, alis fuscis, halteribus luteis.* (Long. .09.)

Resembles *B. limosus*, but is smaller, and the wings darker: the disk of the scutel, as well as the thorax, set with bristles; both have a very dull ferruginous tinge: 1st joint of hind feet very broad, 2d twice as long, scarcely at all thickened: seta of antennæ black.

Common on marine rejectamenta.

B. vagans. *Niger, opacus, scutello pubescente, alis denigratis, halteribus luteis.* (Long. .06.)

Resembles *B. Zosteræ*, but the disk of the scutel is pubescent and not so flat: feet short, fore pair a little dilated.

(—— Division F.) Transverse nervures approximate, 4th and 5th longitudinal not approaching each other, 3d curved to the rib beyond the middle.

Borborus aterrimus. *Ater, holosericeus, alis albis, seta antennarum albida.* (Long. .04.)

Feet short, fore pair a little dilated: seta pubescent whitish: wings opaque, milk-white: rib blackish, the other nervures inconspicuous.

Phora abdominalis. *Fall.*

(To division C.) The termination of the 2d subcostal nervure forked: larger than *P. thoracica;* a female taken but once.

P. debilis. *Fuscus, thorace cano-lineato, alis et pedibus inermibus testaceis.*

(To division E.) Wings deep brown, with darker nervures and hyaline streaks between.

P. Dauci. *Meig.*

This is the female of *Conicera atra.*

P. similis. *Nigra, tibiis et tarsis anticis testaceis, alis subhyalinis.* Mas. *Antennis conicis ascendentibus.*

(To division F.) Half the size of *P. Dauci, (Conicera atra)*, the antennæ shorter: wings more obscurely hyaline, with conspicuous nervures, those of the rib thick and bristly.

P. galeata. *Nigro-fusca, thorace compresso, pedibus inermibus.*

(To division G.) Head compressed, with the dilated front overhanging the eyes: seta of antennæ ascending, feathered, thickened at the root: palpi prominent divaricate, pale: thorax entirely compressed: wings hyaline, rib pubescent: abdomen depressed very broad behind.

This insect is very unlike the rest of the genus, and is still more active than any of them. It occurs on umbelliferæ in autumn, but is not common.

P. aterrima.

In all my specimens the fore shanks and feet only are testaceous, but the difference is too slight to indicate another species, as the like is not uncommon in other species of the genus.

Bibio lanigerus.

The first time I met with this species was in the beginning of April, some years back: walking one sunny morning on a low sandy spit, that runs into the bay at Holywood, and is used for grazing cattle, I was struck by an appearance of innumerable sparkles of light over the short herbage, as far as I could see, resembling the reflections of the sun on a gentle ripple. On looking for the cause, I found the sward covered with this species, principally males, who were in busy movement, exploring and quartering their ground with the skill of a trained setter. The evident object of their search was the

females, who in the proportion of about one to fifty of their partners, were sitting sluggishly on the stems of the grass. I continued my walk for about three hundred yards, without perceiving any diminution of numbers. I then measured off a square foot, and counted within that space thirty-seven; and they did not appear thicker in that spot than in others. Though the species is still abundant in the season, I have never since witnessed an assemblage like this. About noon, they may be seen in sunny gravel-pits, the males soaring about in hawk-like circles; and when they alight, resting with the wings expanded, and ready to take flight on the least shadow approaching. I know of no species in which the disparity of numbers is so great as in the present. In this respect, *B. Johannis* perhaps come next. In *B. Marci* and *B. clavipes*, the difference is still less, and I believe scarcely exists in *B. hortulanus*. This difference of numbers in the sexes is a remarkable point, and must be connected with something in the economy of the species which exhibit it. To mention another instance, I have seen hundreds of *Pezomachus fasciatus* ♀, yet never met with a male, nor has any collector of my acquaintance one of that sex. This circumstance might seem to give support to Geoffroy's opinion, that the males of the *Pezomachi* are winged, in which case it would be more easily overlooked, were there any of our common-winged male *Crypti* at all resembling it, and did we not know the males of several closely allied species to be like their partners. For other instances of the males being quite unknown, I may mention *Megaspilus rubi (Microps Rubi mihi)*, *Ceraphron melanocephalus*, *Cryptus sticticus*, *F.* &c.[b]

Art. XVIII.—*Entomological Tour in South Devon. By Messrs.* Chant *and* Bentley.

Sir,—If you consider the following remarks worthy a place in your Magazine, they are quite at your service. We thought they might in some degree amuse the general reader, and also

[b] We regret to see no reference in this valuable paper to Macquart's "*Insectes Diptères du Nord de la France*," a work in which so many new species of Diptera have been described, that we fear there is a probability of some confusion as to names.—Ed.

furnish some useful hints to the practical entomologist, who may be disposed to visit that part of the country.

We arrived at Exeter in the evening of the 28th of May; but as we had been travelling twenty-eight hours, and had experienced both wet and cold during the journey, we did not feel disposed to commence operations that evening.

May 29th. Fine morning; reconnoitred the ground to the left of the city, in a lane near the Plymouth road: took *Orthotænia Hastiana* and *Adela cuprella* in the afternoon; went to Haldon Hill, to the right of the city; *Brachinus crepitans*, and a few species of *Harpalus* taken: a fine view of the city.

30th. Walked on the banks of the river Exe: fished for *Dyticidæ: Hydroporus depressus* and *Colymbetes maculatus* taken; in the marsh near the river took *Saperda cylindrica.* On our return near the canal, *Peryphus agilis* and *Tachypus striatus* were also taken; we could find no good entomological ground about Exeter; therefore we left in the afternoon for Ashburton, a fine ride through Chudleigh, to the right of which place you see the Hayter rocks, that supplied a great portion of the granite for the erection of new London Bridge. Ashburton is about twenty miles from Exeter, pleasantly situate amongst hills, of which the Buckland Beacon and the Hazel Rock are the most conspicuous.

31st. Collected about the Hazel Rocks: they are situated near two miles to the right of Ashburton, upon an ascent; the whole of the way from the summit of which, we had one of the finest prospects in Devon: there is a fir plantation; also a small copse near the rocks, where, from the appearance of the place, we anticipated much success: took a new *Tortrix,* for which we propose the name *Myrtillana;* we beat it out of the *Vaccinium myrtillus,* which was growing in abundance. In returning to Ashburton, from under stones in a running brook, *Colymbetes guttatus* was taken. In the afternoon went to the Old Bridge: collected about the banks of the Dart; several species of *Bembidiidæ* taken.

June 1st. Fine morning; in the fields near the town, from umbelliferous plants, took many Hymenopterous insects.

2d. The morning rather showery: paid another visit to the Hazel and the Buckland Beacon; from the former place we captured *Ptychopoda fumata,* rare, and some more

Tortrices from the *Vaccinium;* and from under stones, at the latter place, *Elater cupreus.*

3d. Cold and dull: collected on the banks of the Dart, about two miles from Ashburton: took more *Peryphus agilis* and *Tachypus striatus:* wet night.

4th. The weather still unfavourable: left Ashburton for Totness, where we arrived about 12 o'clock; and by the passage-boat sailed to Dartmouth, a delightful sail down the river Dart, which place we reached at 3 o'clock.

5th. This morning went to Blackwell Sands: collected about the beach; *Phycita nebulella, angustella* and *Gemina* taken; also *Crambus pygmæus* and *auriferellus;* both rare: returned to Dartmouth: wet evening.

6th. The morning showery, with cold winds: crossed the ferry to King's Wear; from thence to Brixham and Torbay; near the latter place we found *Harpalus annulicornis* and *ignavus:* returned to Dartmouth. In the evening mothed near the castle: *Miselia compta* and *Lobophora varietata* taken.

7th. This morning visited Slapton Lea, a fresh water lake below Blackwell Sands: it is about one mile in length, and parallel with, and in some places not more than forty yards distance from the sea: it abounds with fresh-water fish and sea fowl: from the margins of which we took *Blethisa multipunctata;* and from the sands, *Dromius quadrillum,* rare: we also found *Malachius marginellus,* and *Dasytes viridis* in profusion, in flowers growing on the sands.

8th. Fine morning: not out entomologizing this day: walked to the hill at the top of the town, and to the castle hill in the evening: a fine promenade for the towns-people, and from which place we had a fine view of the sea and harbour.

9th. Again visited the sands: took more *Phycita;* also *Orthotænia politana* and *Argyrolepia luteloana,* rare.

10th. The morning very hot: walked again to Blackwell Sands: collected more Lepidopterous insects, likewise *Mordella ventralis* and *aculeata:* in the evening, mothed behind the castle: *Deilephila Elpenor* taken.

11th. The weather still fine, we again collected upon the sands: found *Opatrum sabulosum* and *Lixus sulcirostris* in profusion; *Lygæus Apterus* and *micropterus* also taken. This evening we engaged beds at the Star Inn on the beach,

for the purpose of mothing, as there was growing on the sands a number of plants; we thought it would be worth a trial; but to our surprise not an insect was seen.

12th. Fine morning: collected about the lake: the waters of which we observed had greatly decreased by evaporation; from the parts that were still damp we took *Peryphus atro-cæruleus*, and *Notaphus obliquus* in great abundance: we also took from the roots of grass, *Elater 4-pustulatus*, *Anchomenus oblongus*, *Pæderus littoralis* and *fuscipes*. After dinner returned to Dartmouth: in the evening, *Harpalyce Galiata* taken.

13th. This morning returned again to Slapton, and from the lake we had the pleasure of fishing five specimens of *Gyrinus lineatus*, a new species, and *Gyrinus Villosus*: near the lake, *Cassida splendidula*, *Galeruca Sagittariæ* and *lineola* were likewise taken: lodged at the Star Inn this night.

14th. Walked to Tor Cross on the sands: took *Ocys tempestivus*, and more *Dasytes viridis* from *Statice Armeria*. In the evening we proposed trying once more our success in mothing at the lake, but were compelled to make a precipitate retreat in consequence of a tremendous storm of thunder and rain. Stormy all night: the sea very rough.

15th. Dull morning: walked towards King's Bridge: saw the old tower at Slapton; a very ancient ruin, belonging to the Rev. —— Page. The sea still very rough, although the wind had abated many hours: wet night.

16th. The morning more fine: beat *Donacia simplex* from reeds growing in the lake; also a *Tortrix*, that does not appear to be described. After dinner we left Slapton for Dartmouth.

17th. The morning stormy: left Dartmouth in the passage-boat for Totness, where we arrived in three hours, after experiencing one of the most dreadful storms of thunder and rain that we ever witnessed: after a good dinner, and getting ourselves somewhat dry, which we were enabled to do at the Town Arms Inn, we proceeded on to Ashburton, where we arrived at 5 o'clock: it rained in torrents all night.

18th. Notwithstanding the wet, we walked to Holne, Spitchwick and Buckland, a delightful walk along the banks of the Dart: woody for two miles. *Notiophilus rufipes*, and *4-punctatus*, *Odontonyx rotundatus*, *Synuchus vivalis*, *Calathus piceus*, *Margaritia longalis*, *Cordulegaster Annulatus*,

and *Libellula Donovani* taken: in the evening, *Thyatira Batis* taken.

19th. Wet morning: not out till after dinner: paid another visit to Spitchwick and Buckland: captured *Erastria fuscula*, *Electra populata*, rare; a new *Eupithecia*, which we have named *nigro-punctata*,[a] *Ptychopoda fumata*, and *Hypena crassalis*; of the last species there were only three specimens known, and they were all females, taken at Westerham, in Kent, about thirty years since; two by the late Mr. Plastead, and the other by Mr. Haworth: we found both sexes, but the males were considerably the rarest, and are much darker than the female.

20th. Dull morning: went again to Buckland: took more *Hypena crassalis*; also *Eudorea subfusca*, and *Chrysomela varians*, &c.

21st. Again wet and dull: went to Holne Chace, the seat of Sir Boucher Wray; from thence to Spitchwick park, the late residence of that eminent entomologist, Dr. Leach: returned to Ashburton through Buckland; *Cychrus rostratus*, *Argyrolepia tesserana* and *decimana*, and a new *Cnephasia*, also *Quedius lateralis*, rare, taken in Spitchwick park. Near Buckland, we observed *Thecla rubi* in the greatest profusion, hovering over a bank where a species of *Thymus* was in bloom: the bank was sheltered from the wind, which was blowing rather strong at the time: this, together with the attractive scent of thc thyme, was sufficient to account for their congregating together in such prodigious numbers.

22d. More wet with thunder: not out till after dinner; then started for Spitchwick, where we lodged that night at the Tavistock Inn: the evening fair but windy.

23d. Fine morning: walked across Dartmore Forest to Tavistock, a distance of eighteen miles, over hills of an immense altitude, composed of granite, sterile and uninviting; not a tree or bush to be seen, excepting a few willows at Two

[a] Eupithecia nigro-punctata, *Chant.* *Alæ læte virentes strigâ mediâ transversâ undulatâ macularum nigrarum, intus quam anteriores maculas 6 aut 7 nigras habent.*

Alarum dilatio, 9—10 lin.

Eup. V-atæ simillima at satis distincta, paullò major et striga numquam continua sed macularum nigrarum confecta.

Habitat apud *Spitchwick* in *Devon.* imago diebus Junii haud infrequens.

Bridges; near which place we saw *Silpha nigrita* in abundance; but on our return, two days after, scarcely one was found; *Carabus arvensis*, *Blemus paludosus*, *Silpha opaca* and *tristis*, *Byrrhus oblongus*, and several specimens of *Pœcillus versicolor*, the whole of them entirely black, and on Tavistock Bridge, a specimen of *Atherix Ibis*, were taken.

24th. Fine morning: we were determined, if possible, on finding the locality of *Carabus intricatus:* after several hours perseverance and toil, we found ourselves in the little wood on the banks of the Tavey, opposite the Virtuous Lady Copper Mine, the identical place where Dr. Leach discovered the first specimen that was taken in Britain: but our search was in vain; we could find no *Carabus*, but *catenalatus*. On our return to Tavistock, we took *Bombylius minor*, *Elater cupreus* and *æneus*, *Geotrupes vernalis* and *lævis*. In the evening walked to Prince Town, where we lodged that night.

25th. After breakfast we returned to Spitchwick: in the evening mothed in the park. *Pedicia rivosa*, and *Dolichopeza sylvicola* taken.

26th. The weather still fine, collected at Spitchwick and Buckland on our return to Ashburton; and in the evening mothed in the fir plantation, near the Hazel Rocks: nothing new taken.

27th. Very fine and hot weather; packed up and left Ashburton at noon for Exeter, from thence to London, where we arrived at 5 o'clock in the afternoon of the following day.

In taking leave of this interesting county, we must acknowledge that we were rather disappointed in not meeting with more rarities than we did, particularly as the county had been cried up for producing so many; but as we were entire strangers to the place, it may account for it in some measure; taking into the account also that the weather was generally unfavourable for entomologizing.

C.

ENTOMOLOGICAL MAG. 1(2): JAN. 1833

ART. XIX.—*Characters of some undescribed Genera and Species, indicated in the "Guide to an Arrangement of British Insects."* By JOHN CURTIS, Esq. F.L.S.

ORDER.—COLEOPTERA.

Fam.—CORTICARIDÆ. *Curt.*

GEN. 239.*—HOLOPARAMECUS. *Curt.*

Oblong, depressed: head rounded, eyes small and lateral: thorax obcordate, quadrate, broader than the head: scutellum concealed: elytra elliptical: antennæ capitate, nearly as long as the thorax, inserted close before the eyes, 9-jointed, basal joint sub-globose, 2d and 3d long, 4 following sub-globose, the remainder forming a compressed club, the 8th joint semiovate, 9th somewhat ovate, the apex internally angulated: thighs incrassated: tibiæ simple, compressed: tarsi triarticulate? basal joints short, terminal one long and clavate, claws minute.

1. Depressus. *Curt.*

Testaceous, shining, sparingly punctured: eyes black, granulated: thorax with a transverse suture behind, the margins of the posterior angles a little raised, with a deep abbreviated longitudinal channel on each side at the base: elytra with a channel down each side the suture (Length $\frac{1}{2}$ a line.)

This insect appears to connect Scydmænus, and the group I have called Corticaridæ, which has hitherto been included in the family of Engidæ. I took a single specimen in Norfolk many years since, and believe it is granivorous.

GEN. 241.—PARAMECOSOMA. *Curt.*

Elongate-ovate, sub-depressed: antennæ longer than the thorax, capitate pilose: 11-jointed, first 8 joints gradually diminishing in length, the 1st and 2d robust, especially the former, the latter ovate, the 9th, and following, forming a compressed club, 9th joint obtrigonate, 10th subturbinate, 11th orbicular, the apex produced internally: head trigonate, eyes lateral: thorax slightly transverse-quadrate, the sides a little convex: scutellum transverse-ovate: elytra elliptical: thighs and tibiæ simple: tarsi 5-jointed, 4th joint minute, 5th the longest: claws slender.

1. Bicolor. *Curt.*

Shining, ferruginous, clothed with short ochreous pubescence: head, eyes, thorax, and scutellum black, strongly and thickly punctured,

* The numbers throughout refer to the "*Guide.*"

the thorax convex, with a small fovea on each side at the base, near the posterior angles: elytra with strong lines of punctures very close together. (Length $\frac{2}{3}$ of a line.)

My specimen was taken at Southgate, and presented to me by Mr. F. Walker.

Gen. 245.[a]—Lissodema. *Curt.*

Elliptical, convex: antennæ inserted in cavities close to and before the eyes as long as the thorax, clavate, pubescent, and 11-jointed, the first 8 joints short, the 1st and 2d but slightly larger than the 3d, the following gently increasing in stoutness, the 3 terminal forming a long robust club, the 9th and 10th joints cup-shaped, the 11th longer and ovate-conic: head trigonate, eyes lateral; thorax orbicular, the sides dentated: scutellum triangular: elytra very long and elliptic: legs short: thighs and tibiæ simple: tarsi 5-jointed; posterior pair 4-jointed? the basal joint being as long as the terminal one: claws slender.

1. Heyana. *Curt.*

Pitchy chesnut, shining, strongly and rather regularly punctured: thorax with 4 or 5 denticulations on each side, and a fovea near each posterior angle: elytra with numerous irregular lines of punctures: mouth, antennæ, and legs, pale castaneous. (Length $1\frac{1}{3}$ line.)

Taken by the Rev. Samuel Hey, of Ockbrook, after whom I have the pleasure of naming this curious beetle; it has the habit of a Rhyzophagus, but the antennæ are different; and, if I mistake not, the tarsi are heteromerous.

Order. — Hymenoptera.

Fam.—Ichneumonidæ.

Gen. 546.—Macrocentrus. *Curt.*

Mandibles notched at the apex: maxillary palpi very slender, and as long as the thorax, 5?-jointed, basal joint short, terminal ones nearly of equal size and length: labial palpi tri?-articulate, basal joint the shortest, terminal one the longest: antennæ longer than the body, slender, filiform, basal joint robust and ovate: head transverse: thorax elongate-ovate: abdomen, subsessile, fusiform, or clavate: ovipositor as long as the antennæ: superior wings, with the marginal cell nearly reaching the apex, 3 sub-marginal cells, the central one oblong; 2 discordal cells, the superior one large: inferior wings, with distinct nervures.

1. Bicolor. *Curt.*

Piceous, shining, pubescent: mouth and thorax orange-ochre: post-scutellum rugose, stigma ochreous, nervures pale brown: base of abdomen subcastaneous, the back, excepting at the apex, finely sculptured in vermiculated striæ: oviduct ferruginous: legs pale ochreous, tips of posterior tibiæ and tarsi fuscous. (Length 3 lines, ovipositor $4\frac{1}{2}$ lines.)

Gen. 548.—Plancus. *Curt.*

Antennæ filiform: not so long as the body, composed of 13 joints, basal joint rather the stoutest, and chalice-shaped, 2d globose, 3d long, the remainder decreasing in length: palpi minute: head transverse: eyes large: ocelli 3, very large: thorax small and globose: abdomen long and clavate: ovipositor shorter than the groove that receives it: superior wings, with a long narrow stigma placed in the marginal cell, which is of the same form: sub-marginal cell 1, arising at the angle of the marginal one, and extending to the posterior margin; discoidal cells 2, the superior one reaching the stigma: inferior wings, with 2 longitudinal and a transverse nervure: posterior legs rather long: coxæ and thighs slender: tibiæ rather clavate, tarsi thicker than the thighs, the basal joint longest, very long in the 1st and 2d pair.

1. Apicalis. *Curt.*

Ochreous, shining: antennæ, excepting the 2 basal joints, and head excepting the mouth, blackish: back of thorax and apex of abdomen black, the base and middle of the latter fuscous: stigma and nervures brown: legs pale ochre, posterior pair testaceous. (Length $1\frac{1}{2}$ line.)

Of this remarkable insect, I have seen only the female in my cabinet, which I believe I took in the neighbourhood of London.

Order.—Trichoptera.

Gen. 757.—Silo. *Curt.*

Palpi pubescent only, maxillary the longest, the 3 terminal joints of equal length: antennæ not longer than the wings, inserted in front of the head, setaceous: basal joints porrected and parallel, long, stout, cylindric, and hairy, the remainder very short: head small, transverse, very hairy on the crown: eyes lateral and prominent, abdomen short: wings nearly twice as long as the body, rather obtuse-lanceolate: superior, with 2 costal nervures, and below them 3 furcate ones, and 3 others united near the disk,

with a curved one near the posterior angle: inferior wings rather small, with 4 furcate, and several other nervures, cilia short: intermediate and posterior tibiæ spurred at the apex, with a pair of spurs also below the middle.

4. Flavipes. *Curt.*

Rather silky ochreous: thorax and abdomen piceous, inferior wings, and under side, also the coxæ and thighs, fuscous. (Length 3, breadth 11 lines.)

The Phryganea atrata of Fabricius, which I did not possess at the time the *Guide* was published, does not belong to this genus, but his P. pallipes, I think, may be considered the type of it.

Order.—Lepidoptera.

Fam.—Noctuidæ.

Gen. 846.—Rhizolitha. *Curt.*

Palpi hairy, not projecting beyond the head, porrected horizontally: antennæ rather long and stout, slightly ciliated beneath: head with a conical brush of hair projecting over the face: thorax crested: abdomen subdepressed, truncated, and tufted at the apex: wings incumbent when at rest, superior, long, and narrow, with a bifid line at the base, posterior margin rounded, and slightly dentated: inferior wings, with the margin undulated.

I am totally averse to changing names, especially generic: I therefore think the practice a very bad one, of raising a specific name to designate a genus, by which both are disturbed, except as in the present case, where the name is merely a synonym, the type being the Noctua Lambda of Haworth's *Lep. Brit.*

Gen. 867.—Lampetia. *Curt.*

Palpi densely clothed with short scales, forming a beak: maxillæ shorter than the antennæ, which are long: thorax with a subconic crest on the back: abdomen very flat on the back in the males, and rounded at the apex: wings decumbent when at rest; superior rounded at the shoulder, truncated at the apex, which is acute: inferior slightly scalloped: thighs and tibiæ broad and compressed.

I do not know a better characterized form amongst this difficult family, than the Noctua croceago of *Fab.* the type of

our genus; and am surprised that neither Duponchel nor Stephens has made a genus of it.

Fam.—PYRALIDÆ, *or* CRAMBIDÆ.

GEN. 992.—HOMŒOSOMA. *Curt.*

Labial palpi porrected horizontally considerably beyond the head, slender and tapering: maxillæ much shorter than the antennæ, which are simple and setaceous, the palpi minute: abdomen terminated by a pencil of scales: wings convoluted, I believe, when at rest; superior narrow, sublanceolate, and rather obtuse; inferior ample.

1. Gemina. *Haw. Lep. Brit.*

Dirty ochre, shining: superior wings with an irregular fuscous bar at the middle, another, forming a fimbria, and a 3d between them; inferior wings fuscous. (Length $3\frac{1}{3}$, breadth 9 lines.)

This insect is distinguished from Crambus by the shortness of the labial palpi, and from Phycita by their straightness. Mr. Stephens has included it with the Phycitæ.

Fam.—TINEIDÆ.

GEN. 998.—DASYSTOMA. *Curt.*

Male, rough, hairy: palpi forming 2 hairy brushes: antennæ rather long, distinctly ciliated: head broad and hairy: abdomen rather short and stout: superior wings lanceolate, the costa arched, 2 nervures at the base, and a transverse one beyond the middle elevated: legs rather robust, the spurs stout.

1. Salicella, *Hüb. Tin.* Pl. 2, Fig. 9. *a dark variety of the male:* incompletaria, *Haw. Lep. Brit.* ♀.

Our British specimens are generally rosy in colour; this insect approaches nearest to Tinea Phryganella, *Hüb.*; but is distinguished from it by the obtuse hairy palpi.

GEN. 1000.—CHEIMAPHASIA. *Curt.*

Male, smooth, shining: palpi very minute, slightly hairy: antennæ short, slightly pubescent beneath: head small, pubescent on the crown: abdomen rather slender: superior wings sublanceolate, very much narrowed towards the base: legs slender, the spurs small and acute. Wings of the female lanceolate, hairy, shorter than the body.

1. Gelatella, *Lin. Faun. Suec.* 1450. *Hüb. Tort.* Pl. 42, Fig. 266. ♂, ♀.

Both the above insects are included under the same head, by Mr. Stephens.

Gen. 1027.—Ederesa. *Curt.*

Palpi slender and drooping, longer than the head, the crown of which is clothed with a tuft of hairs: superior wings linear-lanceolate, the costa arched, with a pale or white interior margin, interrupted by a dark oblique fascia.

8. Semitestacella. *Curt.*

Testaceous, shining: palpi, crown of head, and antennæ white; the latter beautifully spotted with black: superior wings, with a white flame-shaped stripe on the inferior margin, and 2 pale spots on the costa towards the apex: inferior wings gray, cilia fuscous: tibiæ and tarsi spotted above with black. (Length 2, breadth 7 lines.)

The type of this genus is the Tin. pruniella, *Linn.*: the form of the superior wings, and their pale inferior margin, will distinguish this group from my Argyromiges, as well as from Argyrosetia. Tin. semitestacella was taken in the New Forest by Mr. Lyell; and it is possible that my E. semipurpurella may only be a dark variety of the same.

Gen. 1039.—Chrysocorys. *Curt.*

Palpi slightly curved, slender, and attenuated, longer than the head, composed of 3 joints, apparently of nearly equal length: antennæ rather short, and serrated with whorls of short scales: head and thorax clothed with metallic scales lying close to the surface: abdomen short and slender: wings narrow and lanceolate: superior long, and slightly disposed to be falcated: cilia long: spurs to hinder tibiæ exceedingly long and slender.

1. Angustipenella, *Guide.* Scisscella, *Haw. Lep. Brit.* 580, 69.

I think there is little doubt but this pretty and curious little moth is the Tin. Festaliella, *Hübner*, Pl. 67, 449; but I am doubtful if it be his Tin. scissella, Pl. 39, 270, the wings being of a different shape.

Order.—Homoptera.

Fam.—Tettigonidæ. *Curt.*

Gen. 1053.—Eupteryx. *Curt.*

Face subtrigonate, the head appearing crescent-shaped above; rostrum short and lanceolate: antennæ inserted in a cavity under each eye, triarticulate, 1st and 2d joints stout, the former subglobose, the latter oblong, 3d very slender, and terminated by a fine long seta: ocelli none: thorax small, transverse, scutellum triangular: superior wings narrowed and rounded, with a few indistinct nervures; inferior transparent with a few nervures: legs rather slender, posterior long; the tibiæ clothed with spiny bristles from the base to the apex outside; pectinated with spines on the inside, except at the base: tarsi triarticulate, elongated in the hinder pair, the basal joint being the longest, the terminal one the shortest.

7. Hortensis. *Curt.*

Greenish sulphur: sides of face, 2 minute dots in front, and 2 spots on the crown black: thorax with 8 black spots, scutellum with 2 at the base, the former with a double fuscous line down the back: abdomen black: superior wings with many brownish spots between the nervures, leaving 2 yellow oval ones on the costa, and a minute one towards the apex: posterior thighs spotted with fuscous, their tibiæ black, except at the base, the tarsi white tipped with fuscous. (Length $1\frac{1}{2}$ line.)

I found several of these insects in a garden in the Isle of Wight, the middle of October; it is distinguished at once from the type of our genus (C. picta, *Fab.*) by its black posterior tibiæ.

Gen. 1054.—Amblycephalus. *Curt.*

Face elongate-trigonate including the clypeus: head viewed above, lunate: ocelli 2 on the crown: eyes prominent: rostrum short, stout, and cylindrical: antennæ inserted before the eyes in a cavity, triarticulate, basal joint the stoutest, chalice-shaped, 2d shorter ovate, 3d a bristle as long as the head: thorax narrower than the head, transverse ovate: scutellum triangular: abdomen rather long and conical in the female: superior wings a little longer than the body, subovate, the inferior margin nearly straight, inferior wings rounded, all with many distinct nervures: posterior tibiæ long, thin, and slightly curved, clothed irregularly with spines externally, pectinated internally, except at the base: tarsi triarticulate, basal joint the longest in the posterior pair.

3. Germari. *Curt.*

Dull ochreous white, finely pubescent: head piceous, round the eyes

and a transverse spot on the forehead ochreous: thorax and scutellum piceous, the former with 2 ferruginous spots at the base: abdomen variegated with fuscous: superior wings fuscous between the nervures, especially towards the apex, leaving 2 large pearly spots on the costa. (Length $2\frac{1}{3}$ lines.)

The type of our genus is the Cicada viridis, *Linn.* The above species (which I have named in honour of the learned Professor Germar,) as well as the C. interruptus, differ in some measure, in having the crown of the head slightly excavated.

Gen. 1055.—Agallia. *Curt.*

Rather short and ovate: face ovate-trigonate: clypeus narrow: head from above forming a very narrow lunule: ocelli 2 in the forehead: antennæ triarticulate setiform: rostrum neither short nor stout, attenuated: thorax narrower than the head, transverse-ovate: scutellum triangular; wings very much deflexed, superior, with the costa considerably rounded, the interior margin nearly straight, the nervures reticulated towards the apex: anterior legs short, posterior the longest; the tibiæ spined externally, pectinated internally: tarsi triarticulate, basal joint long in the hinder pair.

2. Consobrina. *Curt.*

Pale testaceous: head prettily pencilled with ferruginous, with 2 remote black spots at the base: thorax with 4 black dots in a transverse line before, a ferruginous lanceolate line down the centre, and a triangular one on each side: scutellum with 2 triangular black spots at the base, and 2 dots in the middle: nervures, and 2 spots on the internal margin brown, the former more or less suffused: posterior tibiæ with a line of black dots down the outside. (Length $1\frac{1}{2}$ line.)

The form of the head and the situation of the ocelli, well distinguish this from the foregoing genera.

Gen. 1057.—Megophthalmus. *Curt.*

Somewhat ovate: antennæ inserted on each side the middle of the face, as long as the thorax, 1st and 2d joints stout and ovate, 3d setiform: head, viewed from above, forming a very narrow lunule with the anterior edge, forming an elevated margin: face ovate-trigonate, with two elevated oblique lines at the top, forming a transverse $\asymp$ with the margin of the forehead: rostrum rather long, and tongue-shaped: eyes projecting beyond the thorax:

ocelli 2, placed in the angles of the cavities formed by the ><: thorax transverse, anterior margin convex, posterior slightly concave, the angles truncated: scutellum trigonate, slightly cuspidate: superior wings very much deflexed, the costa very convex, the suture straight, nervures raised: inferior wings very small: posterior tibiæ with a few external spines, ciliated internally towards the apex.

1. Bipunctatus. *Curt.*

Dirty ochre, face and thorax spotted with pale brown, 2 blackish spots on the crown of the head: scutellum with 2 spots at the base, the tip, and a sub-rhomboidal one in the centre, black: superior wings variegated with brown, the spots largest and darkest on the disc, with 2 on the suture: thighs spotted with brown. (Length 1¼ line.)

This genus most resembles Fallen's Ulopa; but it is totally different to any other group; it is not improbable that Fabricius's C. reticulatus, belongs to this genus. I found the specimens under stones in the Isle of Portland, in June; and if I be not mistaken, they were much handsomer when alive.

Gen. 1058.—Phrynomorphus. *Curt.*

Oblong, smooth and shining; head crescent-shaped above, the forehead slightly angulated, face very broad, subcordate or scutiform: antennæ short, inserted in a cavity before the eyes, triarticulate, 2 first joints sub-ovate, 3d forming rather a short and stout seta: eyes projecting, subconical: ocelli 2, very remote and minute, placed on the margin of the forehead: thorax transverse: scutellum rather small and trigonate: superior wings obtusely rounded, the nervures very obscure; inferior ample: abdomen short: hinder legs very long, especially the tibiæ, which are compressed, and slightly curved, thickly set with spines externally, and ciliated internally.

1. Nitidus. *Curt.*

Black, shining, head with three ochreous spots at the base, edge of the clypeus, 2 lines at the apex, one under each eye, and a dot above the antennæ ochreous, centre of the face transversely striped with the same colour: thorax and scutellum variegated with ochre, the superior wings fuscous, freckled with ochre: thighs, and spines of tibiæ, variegated with ochre. (Length 1½ line.

I have seen but one specimen of this distinct insect, which I took many years back, I believe, in Norfolk.

Gen. 1059.—Aphrodes. *Curt.*

Suboval: head flat or hollowed above, subtrigonate-lunate, wedge-shaped in profile, face suborbicular, clypeus slightly emarginate on each side: antennæ inserted in cavities under the forehead, small, triarticulate, 2 first joints very short, 3d slender and setiform: rostrum short and cylindric: eyes ovate, scarcely projecting beyond the thorax: ocelli very minute, remote, and placed above the margin of the forehead: thorax transverse ovate-lunate; scutellum trigonate, cuspidate: superior wings convex-deflexed, not longer than the body: posterior tibiæ very long, broad and curved, with series of long spines on the margins.

9. Testudo. *Curt.*

Shining, pale dirty ochre, an interrupted brown band across the middle of the wings, and another near the apex: tips of tibiæ and tarsi piceous, hinder legs, with the tips of the thighs, the tibiæ, and tarsi, excepting the base, of the same colour. (Length $1\frac{2}{3}$ line.)

I have a single specimen of this insect, and have scarcely any doubt that Linnæus's Cicada bifasciata belongs to this genus, which, as well as the others above described, are at once distinguished from Tettigonia by their long spined posterior tibiæ, as well as by their shorter rostrums.

Fam. Fulgoridæ.

Gen. 1066.—Criomorphus. *Curt.*

Cylindric-ovate: head narrow, semicircular, face trigonate with longitudinal carinæ, eyes large and not very remote, with a notch beneath, and a large groove to receive the antennæ, which are triarticulate, 1st and 2d joints large, the latter ovate and tuberculated, the 3d a very fine long hair: rostrum rather long and linear: thorax very short and broad, overlapped by the eyes: scutellum broad, cuspidate-trigonate: superior wings very short, subquadrate or ovate, with a few longitudinal nervures: inferior none: abdomen extending far beyond the wings, conical: posterior legs a little the longest, their tibiæ subcylindric, dilated towards the apex, where there are several small and one large serrated spine: tarsi triarticulate, terminal joint the longest, except in the posterior pair in which the basal one is elongated.

3. Albomarginatus. *Curt.*

Subochraceus: antennæ, head, thorax, and abdomen piceous, the 1st with the tips of the joints ferruginous, the 2d with the carinæ

ochreous, the margins of the thorax and scutellum, and a line down the middle, ochreous: segments of the abdomen margined with white, and a line down each side of the same colour. (Length 1⅓ line.)

The shortness of the basal joint of the antennæ will distinguish this group from Asiraca, and the abbreviated elytra from Delphax.

Order.—Hemiptera.

Fam. Cimicidæ.

Gen. 1085.—Galeatus. *Curt.*

Rostrum long and slender, received into a groove under the head and between the coxæ: head bidentate, the clypeus emarginate: antennæ slender, hirsute, and 4-jointed; 2 first joints short, 3d long and slender, 4th elongate-ovate: thorax with the sides dilated, the anterior angles lobed, the centre forming a hood over the head, carinated behind, and assuming the figure of an acute triangular scutellum: superior wings slightly overlapping at the apex, orbicular ovate, beautifully reticulated with raised nervures, with the part over the margin of the abdomen elevated.

1. Spinifrons. *Fall.*

The form of the antennæ and the size of the hood distinguish this genus from Dictyonota of *Curtis's Brit. Ent.* Pl. 154.

Gen. 1089.——— *Curt.*

Head small, and produced over the rostrum, which is long and slender: antennæ approximating, inserted in front of the head, clavate and 4-jointed, basal and 2d joints short, subovate, 3d very long and slender, 4th elongate clavate, hirsute: thorax rhombiform, being scutelliform behind, with a carina down the back, the sides thickened: superior wings ovate, with two elevated lines, forming a loop on each.

1. Humili. *Fab.*

I indicated this insect as a genus in my *Guide*, but I think it quite unnecessary to separate it from Tingis.

Gen. 1090.—Aspidotoma. *Curt.*

Subelliptical, depressed: head rather broad, with a spine before each eye, and two conniving ones over the clypeus: eyes prominent: ocelli 2 at the base of the head: antennæ inserted in a notch on each side the head before the eyes, 1st and 2d joints

small, 3d long and slender, 4th stouter and ovate: thorax subquadrate, the angles rounded convex, the anterior margin thin, the sides slightly emarginate: scutellum trigonate minute: superior wings elongate-ovate, with 2 elevated nervures forming a loop on each.

1. Capitata. *Wolff.*

This genus is at once distinguished from the other Tingidæ by its thorax being truncated behind, and the scutellum being visible.

Fam. COREIDÆ.

GEN. 1104.—PANTILIUS. *Curt.*

Elliptical, depressed: head small, subtrigonate: eyes very prominent: rostrum not long, but very slender: antennæ inserted before the eyes, almost as long as the body, subsetaceous and geniculated, 4-jointed, basal joint rather long, robust, and cylindric, 2d thrice as long and slenderer, 3d not so long as the 1st, and more slender, 4th the shortest, somewhat tongue-shaped: thorax trapezoid: scutellum triangular: wings considerably longer than the body, superior very long and linear, a little dilated and rounded at the apex, with 2 strong nervures forming a loop on the membranous part: inferior wings ample: legs nearly of equal length, the posterior tibiæ rather the longest, and not bristly: tarsi very short, basal joints minute.

1. Tunicatus. *Fab.*

This genus is identified by the shortness of the terminal joints of the antennæ, by its smooth and comparatively short hinder tibiæ, and the short tarsi.

GEN. 1114.—LORICULA. *Curt.*

Folliform:[b] head elongated, cylindric, the nasus produced: antennæ attached to 2 scapes before the eyes, which are lateral, but not very prominent, shorter than the body, slightly clavate, and 4-jointed, basal joint short and subovate, 2d the longest, subclavate, the others nearly of equal length, the terminal joint rather stouter, and ovate at the apex: rostrum long and attenuated: thorax considerably broader than the head, subtrapezoid, anterior margin concave, posterior nearly straight: scutellum rather large and triangular: superior wings ovate-trigonate, very

[b] As this is a term not mentioned by Mr. Kirby, it may be as well to state that it signifies, of the shape of bellows; viz. pear-shaped, but depressed.

short, not covering more than half the abdomen, which is nearly orbicular, and a little acuminated at the apex: posterior legs a little the longest.

1. Pselaphiformis. *Curt.*

Black, shining: head ferruginous, red at the base: 2d joint of antennæ ochreous at the middle: thorax, scutellum, and elytra dull, sparingly clothed with short yellowish pubescence, the latter with the margins suffused, dirty testaceous: legs ochreous, thighs black, except at the tips. (Length $\frac{2}{3}$ of a line.)

Taken by Mr. Booth, near Halifax, Yorkshire, and presented to me by Mr. A. H. Davis.

Gen. 1120.—Chlamydatus. *Curt.*

Subovate: head rather large and trigonate: eyes projecting beyond the thorax: antennæ inserted before the eyes, shorter than the body, filiform and 4-jointed, basal joint the shortest, and a little the stoutest, 2d the longest, 3d and 4th a little shorter and slenderer, of equal length: rostrum nearly as long as the antennæ, and very slender: thorax nearly semiorbicular: scutellum triangular: abdomen large, flat, and ovate: the superior wings not covering much more than half, ovate, and not lapping over at the apex: posterior legs long, the thighs incrassated, tibiæ very long, tarsi long and thin, triarticulate, basal joint short, truncated obliquely, 2d and 3d nearly of equal length.

1. Marginatus. *Curt.* Grylloides. *Guidé.*

Pitchy, sprinkled with yellowish pubescence: posterior margin of head and eyes ferruginous: superior wings ochreous, with a large patch of piceous in the centre, leaving a sinuated pale margin all round, broadest at the base: legs dull ferruginous, thighs black, except at the tips. (Length 1 line.)

Gen. 1123.—Hebrus. *Curt.*

Somewhat elliptical: head oblong, the nasus produced and quadrate: eyes not very prominent: antennæ shorter than the body, subfiliform: inserted near the apex of the head, 5-jointed, basal joint the stoutest, and as long as the 3d and 5th; the 2d and 4th rather shorter, terminal joint subfusiform: rostrum as long as the thorax, attenuated and acute: thorax somewhat trapezoid, gibbose, concave before, very much rounded behind, forming 2 large obtuse angles: scutellum triangular obtuse: abdomen semi-elliptical: superior wings somewhat elongate-spatulate, with a

very thick abbreviated costal nervure, and another beneath it: inferior wings membranous: posterior legs the longest, thighs thickened, posterior a little thinner and bent: tarsi triarticulate, 2 basal joints minute, 3d rather large: claws only one to each tarsus.

1. Pusilla. *Fall.* Walkeri. *Curt.*

Black, head shining, with a channel on the crown, the base and eyes subferruginous: thorax velvety, with aureous pile, the angles on the side gibbose, a large channel down the middle, and a smaller one on each side: scutellum with 2 large excavations, leaving a ridge down the middle: superior wings, when folded, with a pearly white spot on each side the scutellum, and three on the membranous apex in triangle: 1st joint of antennæ and base of 2d joint ferruginous, legs of the same colour, tips of tarsi black. (Nearly 1 line long.)

This remarkable and pretty little insect was first discovered at Southgate, by F. Walker, Esq.; and afterwards in the west of England, by J. C. Dale, Esq. It inhabits ponds, where it is found on duckweed.

Art. XX.—*Notice of the Habits of Charæas Graminis, &c.* By George Wailes, Esq.

[to the editor of the entomological magazine.]

Sir,—I beg you will correct an error in my list of Castle Eden insects, published at page 41, by substituting *Emmelesia tæniata* for *E. ericetata.* Upon a re-examination of my captures at that place in 1831, I have detected another specimen of the above moth, though, from the injury it received in the capture, I was unable to ascertain its name at the time. I met with it near the top of the north branch of the Dean, where the yews almost totally exclude the rays of the sun. On a trip to the Dean in August last, in company with my friend, the Rev. G. T. Rudd, I took a remarkably small specimen of *H. Blandina,* measuring only one inch five lines from tip to tip. It was quite perfect, and had just quitted the pupa state. I mention the circumstance, because it has been reported that

H. Cassiope had been taken at Castle Eden in company with *H. Blandina;* and most probably that report originated in the capture of a similar dwarf specimen, which, to an unexperienced eye, would not appear to differ very perceptibly from some females of *H. Cassiope.*

The following notice of the habits of *Charæas graminis* may not be unacceptable.

Though the devastations committed by the larvæ of this moth in our island do not in general appear to bear any comparison with its ravages in the Swedish pastures, yet when, from the failure of some of the checks appointed for keeping it within proper bounds, the species is left to increase unmolested, its effects are very apparent, as the following instance will shew. Some years ago (in 1824, I believe), during the spring and early summer, the herbage of a large portion of the level part of the mountain of Skiddaw, near the well which most tourists visit on the ascent, previous to climbing to the summit of the first *Man,* comprising at least fifty acres, and extending some distance down the western side of the mountain, was observed, even from the town of Keswick, to assume a dry and parched appearance; and so marked was the line, that the progress made by the larvæ down the mountain could be distinctly noted. Nor was the change of colour of the herbage the only thing that attracted the attention of the good folks of Keswick; large flocks of rooks, attracted, no doubt, by the abundance of food which these larvæ afforded them, were every morning seen wending their way to the spot, both from the rookeries at Lord's Island, and other places in the Vale of Keswick, and also from those of distant ultramontane parts of the neighbourhood, and, after spending the day in preying upon the unfortunate caterpillars, on the approach of night, rising in one dense cloud, and dispersing to their respective homes. Though their numbers must have been in this manner greatly reduced, yet I was informed, by a very intelligent friend residing at the foot of the mountain, that in August the moths literally swarmed throughout the neighbourhood. So completely was vegetation destroyed, that, on a visit to the spot in 1830, the extent of their ravages was distinctly visible, being very similar to the effect produced by the burning of heath, which is so much practised on all our hills. Of course the quality of the newly grown herbage was materially improved;

thus affording another instance of indirect advantages derived from insects.

Another very remarkable fact, illustrative of the natural habits of this moth, fell beneath my observation in the beginning of August, 1831. I was staying at Meldon Park, on an entomological excursion, and, by chance, one morning visited some old pastures about a mile from that place; this was about eight o'clock; and my astonishment was very great to find the fields swarming with moths upon the wing. I managed to capture one with my hat, having neglected to take out my net, and was delighted to find it was the above *Noctua*, of which I had only captured an occasional specimen or two, flying amongst thistles in the middle of the day. I returned to breakfast, fully calculating on getting an ample supply during the forenoon. Accordingly, big with expectation, and completely prepared for the onslaught, I reached the spot about ten o'clock; and if my first surprise on beholding the countless myriads on my morning walk was great, it was not less so on my return, to find that in the same place where, not three hours before, I could scarce step without treading on them, a single specimen was all that rewarded my incessant search for some hours, over the space of at least one hundred and fifty acres. Chagrined at my ill-luck, I determined that the peep of the morrow's dawn should find me prepared to profit by the experience of that day; and accordingly, taking an assistant with me, we reached the place early; but not a moth was to be seen. The wind had changed to the east, and the drifting mist threatened to end in rain; and having fixed that day for my return to Newcastle, I felt somewhat disappointed, and wandered over the ground in the hopes that some single specimen might venture forth, but in vain; not a solitary moth was to be seen. Despairing of success, and wet and uncomfortable, from the heavy dew on the grass and moist fog over head, about half-after seven I was about to return, when suddenly the whole field, as far as the eye could reach, was once more the scene of their gambols. Struck with the suddenness of their reappearance, and rejoicing at their unexpected return, I put Horace's truly entomological recommendation—

"Carpe diem, quam minimum credula postero"—

into force. And now the difficulty was, not where to find a

moth, but which one of the numberless thousands on the wing to select for an object of capture, as their flight was so rapid and irregular, that the eye became bewildered with their motions, and, like the *Gyrini*, they were lost in the mazes of their evolutions. After securing what specimens I wanted, I could not help watching the scene before me; and, as in the study of all nature's works, the trouble, or rather the time spent, was more than amply repaid; for sudden as their appearance had been, their disappearance was equally so, when, as with one general consent, about half-after eight, they again settled; and their flight for the morning being over, scarce a solitary specimen was anywhere to be seen. The moths flew about three or four inches from the ground, and apparently very seldom alighted, but threaded their way most dexterously amongst the long culms of the grasses. I reached home, not only pleased with my capture, but infinitely more so with the interesting habits of this insect; and I regret that I have not had an opportunity of again witnessing them. The species, though common hereabouts, has been considered rare in the south of England, probably from our being ignorant of its habits.

GEORGE WAILES.

ART. XXI.—*Monographia Notiophilôn Angliæ.*—By GEORGE R. WATERHOUSE, Esq.

GENUS.—NOTIOPHILUS.—*Dumeril.*

Cicindela, *Linné.* Elaphrus, *Fabricius.*

Head deeply sulcated between the eyes: palpi, with the terminal joint moderate, subovate, truncate: labrum entire, rounded, and nearly covering the mandibles: mandibles slightly dentate interiorly: mentum with the central lobe bifid: antennæ as long as the head and thorax, and thickening towards the extremity: eyes large: thorax as broad as the head: elytra depressed, elongate, and nearly parallel: tarsi the same in both sexes.

A. *Elytris concoloribus.*

Sp. 1. Not. aquaticus. *Æneus, nitidus, capite angustiore, fronte striatâ: elytris punctato-striatis, interstitiis striarum*

tertio quartoque angustioribus: pedibus nigris. (Long. corp. $2\frac{1}{2}$—$2\frac{3}{4}$.)

Cicindela aquatica. *Lin. Syst. Nat.* II. 658.

Above of a brassy hue: beneath bronze black: head about the same width as the thorax, with seven parallel furrows on the forehead, the two outer ones larger and deeper than the rest, leaving a broad ridge next the eye with a deep puncture in the ridge: thorax narrowed posteriorly, the margins coarsely punctured, disk smooth, the dorsal channel rather deep, wrinkled transversely, and curved at the base, so as to join the lateral foveæ, which are rather deep: elytra elongate, with seven punctate striæ on each, the first next the suture, the six following close together and parallel with, but leaving a broad smooth surface between them and the first, and also next the outer margin: the striæ vanish towards the apex, except that near the suture and the seventh, which meet at the apex: between the seventh stria and the outer margin, at the apex of the elytra, is a short deep furrow: the space between the third and fourth stria is broader than the following, and has a deep impression, about one third of the distance from the base to the apex of the elytra: legs, antennæ, and palpi, entirely bronze black.

Var. β.—Totally black.

Common in damp situations throughout Britain.

Sp. 2. Not. metallicus. *Æneo-cupreus, elongatus, nitidus, capite thorace augustiori, fronte profundè striatâ, thorace longiori, posticè angustato, elytris elongatis punctato-striatis.* (Long. corp. $2\frac{3}{4}$.)

Of a rich brassy copper above, beneath brassy black: head rather narrower than in *N. aquaticus*, the frontal sulci close together: the thorax is longer and more attenuated posteriorly, the puncturing finer, but less close together: elytra more elongate and narrower, the striæ not so deeply punctured: legs, antennæ, and palpi, totally black.

I have one specimen of this insect, but am ignorant of its locality.

Sp. 3. Not. nitidulus. *Æneo-niger: capite æneo-cupreo; thorace elytrisque cæruleo-nigris marginibus æneis; capite thoraceque ejusdem latitudinis, sulcis frontalibus parallelis thorace convexo, posticè attenuato; marginibus anticis posticisque densè punctatis; disco foveâ utrinque impresso; elytris paulò convexis, elongatis, ovatis, punc-*

tato-striatis, striis æquidistantibus, lævibus, ad apicem evanescentibus, inter strias, tertiam et quartam, punctato-impressis: antennis, articulis quatuor basalibus rufo-testaceis; palpis articulo basali rufescente; tibiis ad medium piceo-testaceis. (Long. corp. $2\frac{3}{4}$ lin.)

Head brassy copper: thorax and elytra of a rich blue black, the margins rather brassy: head about the same width as the thorax, with the frontal sulci parallel: thorax convex, narrowed behind, the anterior and posterior margins thickly punctured, the lateral margins less so: a small fovea about the centre of each half of the thorax: elytra rather convex, elongate, slightly ovate, punctate, striated: the striæ equidistant, not very deep, and vanishing before the apex: a small impression between the third and fourth striæ on the disk: antennæ black, with the four basal joints rufo-testaceous: palpi black, with the basal joints rufous: legs black, the tibiæ testaceous in the middle. Allied to *N. aquaticus*, but may be distinguished by its greater size and convexity: the head is larger in proportion: the dorsal channel of the thorax is not so deep, and the margins are not so broadly punctured: the striæ of the elytra are less deeply impressed. In *N. Newmanni* (which is a smaller insect) the head is broader in proportion: the thorax more attenuated posteriorly. From *N. parallelus*, which is about the same size, *nitidulus* differs in being much more convex: the head is broader: the thorax rather longer, and not so broadly, but more coarsely punctured: the elytra are not so long, and more ovate: the striæ more remote.

Halifax. A. H. Davis, Esq.

Sp. 4. Not. parallelus. *Æneus, nitidissimus, parallelus; capite thorace angustiori, fronte sulcis parallelis striatâ; thorace lateribus rectis, posticè levitèr angustato, marginibus densè punctatis, sulco dorsali levitèr impresso; elytris longis, lateribus parallelis, punctatò-striatis, striis ad apicem evanescentibus; disco elytrorum puncto impresso; pedibus nigris, tibiis piceo-testaceis; antennis nigris, basi piceo-rubro.* (Long. corp. $2\frac{1}{4}$.)

Æneous, very glossy, long, and parallel: head narrower than the thorax, the frontal sulci parallel: thorax broad, slightly attenuated posteriorly, the margins thickly punctured, dorsal channel slightly impressed: elytra long, the sides parallel, punctate striated, the striæ vanishing before the apex, with an impressed

point on the disk: legs black, tibiæ pitchy-testaceous: antennæ black, with the base pitchy-red.

Allied to *aquaticus*, but may be distinguished by the elongate parallel form, and pale tibiæ. It is also more elongate than *tibialis;* the head is narrower, and the thorax is less attenuated posteriorly.

I have seen but one specimen of this, sufficiently distinct, species, which belongs to E. Newman, Esq.; and was taken on Snowdon.

Sp. 5. Not. Davisii. N. parallelo *similis et forsan ejus speciei varietas; differt in colore nigro, in thorace posticè angustiori, in elytris minùs profundè striatis, et apicem versùs elytrorum ducto utrinque piceo; tibiis, antennarumque tres vel quatuor articulis piceo-rubris.*

Similar to, and may be a variety of *N. parallelus*, differing in being quite black: the thorax also is a little more narrowed behind, and the elytra are less deeply punctate-striated, with a pitchy dash on each side near the apex: the tibiæ and three or four basal joints of the antennæ are pitchy-red.

Snowdon. A. H. Davis, Esq.

Sp. 6. Not. Newmanni. *Æneus, longior; capite thorace longiore, fronte striatâ, striis ab medio divaricantibus; thorace posticè valdè attenuato marginibus punctatis, sulco dorsali levissimè punctato; elytris amplis, punctato-striatis, striis ad apicem evanescentibus; plagâ discoidali augustiore; tibiis et antennarum basi piceo-rubris.* (Long. corp. $2\frac{3}{4}$.)

N. tibiali *similis, at multò major; capite latiore, sulcis frontalibus haud parallelis, thorace longiori, et posticè angustiori.*

Æneous, long: head broader than the thorax, forehead striated, the striæ diverging from the middle: thorax very much narrowed posteriorly, the margins coarsely punctured: elytra ample, punctate striated, the striæ vanishing before the apex, the discoidal space rather narrow. Allied to *tibialis*, but much larger: the head is broader: the frontal sulci are not parallel: the thorax is longer and more attenuated posteriorly: tibiæ and base of the antennæ pitchy-red.

I have seen but three specimens of this insect, which belong to Mr. Newman: they came from Snowdon.

Sp. 7. Not. tibialis. *Æneus, nitidus, fronte striatâ, elytris punctato-striatis, tibiis testaceis.* (Long. corp. $2\frac{1}{2}$.)
N. aquatico *similis, at fermè minor; capite paulò latiori.*

Not. tibialis. *Stephens' MSS.*

Above brassy: head a little wider than the thorax, the frontal sulci as in *N. aquaticus:* thorax attenuated posteriorly, the margins thickly punctured, the dorsal channel rather rugose: elytra moderately long, punctate-striated, the striæ equidistant, vanishing towards the apex: legs black, tibiæ æneo-testaceous, the three basal joints of the antennæ pitchy-testaceous, the rest pitchy-black, basal joint of the palpi red.

Allied to *N. aquaticus*, but generally smaller and shorter, the head rather broader. It may also be distinguished from that species by the pale tibiæ.

Sp. 8. Not. brevis. *Nigro-æneus, brevis, nitidus; capite latiori, fronte profundè striatâ; thorace brevi, marginibus valdè rugosis, posticè angustiori; elytris brevibus, leviter ovatis, profundè punctato-striatis, striis seorsùm æquidistantibus, disco elytrorum inter strias tertiam et quartam a suturâ puncto impresso, punctoque indistincto ad apicem; tibiis testaceis.* (Long. corp. $2\frac{1}{4}$—$2\frac{1}{2}$.)

Brassy black, very glossy: head broader than the thorax, very short, with seven irregular furrows between the eyes, the two outer ones very broad and deep: thorax rather short, much narrowed behind, the posterior angles slightly curved outwards, the margins, together with the base and apex of the dorsal furrow, are very coarsely punctured, the disk smooth and very convex: elytra short, slightly ovate, punctate-striated, the punctures large, not confluent, the striæ rather wide apart and equidistant, an impression between the third and fourth striæ from the suture on the disk, and another less distinct at the apex of the elytra; the space between the first and second striæ is narrower towards the apex of the elytra than at the shoulders: legs black, tibiæ pitchy-red in the middle: antennæ black, with the base pitchy-red: palpi black, basal joint testaceous.

Shorter than *N. aquaticus*, and also differs in having an impressed point on each side at the apex of the elytra:—the *head* is broader, *thorax* more narrowed behind, the six lateral striæ of the elytra are equidistant, the punctures deeper, but not so close together: the tibiæ are pale.

Taken near London. Newcastle upon Tyne; by G. Wailes, Esq. Inverness; H. Smith, Esq."

Sp. 9. Not. latior. *Æneus, nitidus, latus; capite thorace latiori, fronte striatâ elytris punctato-striatis; tibiis testaceis.* (Long. corp. $2\frac{1}{2}$—$2\frac{3}{4}$.)

Brassy, beneath black: head rather broader than the thorax, very short, the frontal sulci as in *aquaticus*: thorax broad, attenuated posteriorly, the margins and dorsal channel thickly punctured: elytra punctate-striated, the striæ deeply impressed towards the base, the fourth and fifth approximating and continuing indistinctly to the apex of the elytra: an impression between the third and fourth striæ on the disk: tibiæ and base of the antennæ rufo-testaceous: palpi testaceous, with the terminal joint black.

Allied to *tibialis*, but is larger and broader; the elytra are more rounded at the sides; the space between the first and second striæ is narrower in proportion.

I have two specimens of this species, taken in the neighbourhood of London.

Sp. 10. Not. pusillus. *Suprà æneus; fronte striatâ, elytris angustioribus, punctato-striatis, plagâ longitudinali ad suturam nitidissimâ, discô elytrorum punctô impressô, punctôque ad apicem; antennis pedibusque nigris: palpis nigris, basi pallidè testaceis.* (Long. corp. $2\frac{1}{4}$.)

Above brassy, beneath black: head about the same width as the thorax, irregularly striated between the eyes: thorax short, and rather broad, attenuated posteriorly, the hinder angles slightly curved outwards, the margins coarsely punctured: the foveæ, on each side in the hinder angles, rather deep, the dorsal channel transversely wrinkled: elytra narrow, the sides very straight, punctate-striated, the striæ continuing indistinctly to the apex of the elytra; the second and third are wider apart than the following, in which the punctures are confluent: an impressed point between the third and fourth striæ on the disk, and another at the apex of the elytra: antennæ and legs totally black: palpi black, with the basal joint pale testaceous.

This species may readily be distinguished from all the foregoing, by its minute size and narrow form, together with the pale basal joint of the palpi, combined with the black legs and antennæ. I am indebted to Mr. Bentley for the loan of the only

specimen of this insect which I have seen, and from which the above description was taken: its locality is unknown.

Sp. 11. Not. parvulus. *Æneus, nitidus, angustatus, fronte profundè striatâ; thorace angustato, ad partem posteriorem valdè attenuato, lateribus rectis; elytris punctato-striatis, striis secundâ, tertiâ, quartâque æquidistantibus, puncto impressis; antennis, pedibus, palpisque nigris.* (Long. corp. $2\frac{1}{4}$.)

The same size as *N. pusillus*: the head is longer, the frontal sulci are deeper and more regular: the thorax is much narrower, particularly behind, and the sides are straight: the elytra are less deeply striated, the striæ vanishing before the apex, which is without the impressed point: the second, third, and fourth striæ are equidistant, the following are very close together: the usual impressions between the third and fourth striæ on the disk are very deep: legs, antennæ, and palpi, totally black.

I have a single specimen of this species, which is very distinct from all the foregoing, and am sorry its locality is unknown to me.

B. *Elytris ad apicem piceis aut flavescentibus.*

Sp. 12. Not. rufipes. *Æneo-cupreus, capite latissimo, fronte profundè striatâ; thorace ad partem posteriorem valdè angustato; elytris punctato-striatis, plagâ nitidâ et latissimâ ad suturam, puncto impressis, apicibus piceis; antennis pedibusque rufis.* (Long. corp. $2\frac{1}{2}$—$2\frac{3}{4}$.)

Not. rufipes. *Heysham's MSS. Curtis* B. E. 254.

Above brassy-copper, very glossy: head very broad, the usual frontal sulci irregular: thorax very much narrowed posteriorly, with the hinder angles slightly curved outwards, the dorsal channel and the margin broadly and very thickly punctured, the disk slightly rugose: elytra moderately long, rather ovate, deeply punctate-striated, the punctures confluent, and the striæ very close together, continuing to the apex, which is rather pitchy, and has a shallow impression on each side; the six lateral striæ are not parallel with the suture, but slightly curved outwards in the middle, in which respect this species differs from all the foregoing: legs testaceous red: femora pitchy red: antennæ testaceous, the terminal joint fuscous: palpi fuscous with the basal joint testaceous.

This species may be distinguished from the foregoing by the pale hue of the legs and antennæ, also by the form of the thorax, which is more attenuated posteriorly, and more thickly punctured; the elytra are more rounded at the sides, the striæ are closer together; the polished surface between the first and second striæ is broader than in any of the foregoing.

Sp. 13. Not. striatus. *Æneo-niger, suprà æneo-cupreus, nitidus; capite thorace latiori, fronte striatâ; thorace valde rugoso, posticè levitei attenuato; elytris profundè punctato-striatis, interstitiis angustissimis, plagâ longitudinali nitidissimâ ad suturam, apice flavescente, punctis duobus impressis; tibiis antennarumque basi rufo-testaceis,* (Long. corp. $2\frac{1}{2}$.)

Broad: above brassy-copper, beneath brassy-black: head broader than the thorax, striated between the eyes: thorax short, very slightly attenuated posteriorly, sides rather straight, very coarsely punctured, disk sometimes nearly smooth: elytra deeply punctate striated, the striæ very close together and continuing to the apex, which is pitchy testaceous, and has a small puncture on each side; a deep puncture also on the disk, between the third and fourth striæ: legs black, tibiæ bright rufo-testaceous: antennæ black, basal joints red.

I believe this species to be common throughout Britain, having seen many specimens from various parts. Common at Inverness; H. Smith, Esq. Newcastle upon Tyne; G. Wailes, Esq. Cambridge; Alex. Griesbach, Esq.

Sp. 14. Not. latus. *Æneo-niger, suprà æneo-cupreus, latus, capite profundè striato; thorace brevi, sulco dorsali, marginibusque valdè rugosis; elytris profundè punctato-striatis, interstitiis angustissimis, plagâ longitudinali ad medium latâ; tibiis rufis.* (Long. corp. $2\frac{1}{2}$.)

Very broad: above brassy-copper, beneath brassy-black: head rather broader than the thorax, deeply striated between the eyes: thorax short, attenuated posteriorly, the margins and dorsal channel rugosely punctured: elytra deeply punctate-striated, the striæ close together and continuing to the apex, which is pitchy-testaceous, and has an impressed point on each side; the longitudinal space is rather broad in the middle: tibiæ and base of the antennæ rufo-testaceous.

Allied to *N. striatus*, but is much broader, the longitudinal

smooth space on the elytra is broader in proportion, particularly in the middle. The only specimen I have seen of this insect was captured at Inverness, by Henry Smith, Esq.

Sp. 15. Not. nitidus. *Æneo-niger, suprà æneo-cupreus, angustior, fronte striatâ, thoracis lineâ dorsali, marginibusque punctatissimis; elytris profundius punctato-striatis, interstitiis angustioribus, apice flavescenti, punctisque duobus impressis, tibiis antennarumque basi rufo-testaceis.* (Long. corp. $2\frac{1}{4}$.)

Narrow æneo-piceus above, beneath brassy-black: head a little wider than the thorax, the forehead deeply striated: thorax short, attenuated posteriorly, the lateral margins slightly waved, the dorsal channel and margins coarsely punctured, the disk smooth, and rather convex; the foveæ, in the hinder angles, rather deep: elytra punctate-striated; the striæ are close together and continue to the apex, which is pitchy testaceous, and has an indistinctly impressed point on each side, another on the disk of the elytra between the third and fourth striæ: tibiæ and base of the antennæ testaceous.

Allied to *N. striatus*, but not more than half the size, and much narrower in proportion, the disk of the thorax is perfectly smooth. I have seen but one specimen of this insect, which was taken by myself in the neighbourhood of London.

Sp. 16. Not. biguttatus. *Æneo-niger, suprâ æneus, capite thorace angustiori, fronte striatâ, thorace brevi, punctatissimo; elytis lævissimè punctato-striatis, interstitiis striarum secundo, tertio, quartoque latioribus; puncto impresso; apice flavescenti, antennarum basi rufo-piceo-pedibus nigris.* (Long. corp. $2\frac{1}{4}$—$2\frac{1}{2}$.)

Elaphrus biguttatus. Fab. E. i. 247.

Above æneous, beneath brassy-black: head narrower than the thorax, striated between the eyes: thorax broad, slightly narrowed posteriorly, the margins and dorsal channel rugosely-punctured, the disk very finely punctured, the foveæ on the hinder angles not very deep: elytra delicately punctate-striated, the third and fourth striæ wider apart than the following: an impressed point between the third and fourth, on the disk, and another less distinct at the apex which is flavescent: legs and antennæ black, the base of the latter pitchy testaceous.

In this species the head is narrower than in its allies; the

elytra are very delicately striated; the space between the second, third, and fourth striæ is wider than in the following.

Common in the neighbourhood of London. I have also received it from Inverness, where it appears to be rare.

Sp. 17. Not. substriatus. *Angustior, æneo-niger: fronte striatâ, thorace longiori, posticè valdè attenuato, densè, et lævissimè punctato, disco lævi, sulco dorsali transversè rugato: elytris, striis quinque lævissimè punctatis, apicibus pallidis, tibiis antennarumque basi rufo-piceis.* (Long. corp. $2\frac{2}{3}$.)

Narrow brassy black: head as wide as the thorax, the frontal sulci not very deep: thorax rather long, considerably narrowed behind, the margins very delicately, but thickly punctured, the disk indistinctly wrinkled: elytra with six very delicately impressed punctate striæ, one next the suture, and five on the disk, of which the third and fourth are close together: apex pale, pitchy-testaceous: base of the tibiæ and antennæ the same.

Allied to *biguttatus*, but rather smaller, and more elongate; the thorax is narrower and more attenuated behind; the elytra are more delicately striated.

Halifax; A. H. Davis, Esq.

Sp. 18. Not. Quadripunctatus. *Suprà æneus, nitidus; fronte profundè striatâ; elytris profundè punctato-striatis, plagâ longitudinali nitidissimâ ad suturam, apice flavescentibus, punctisque duobus impressis.* (Long. corp. 2—$2\frac{1}{2}$.)

Not. Quadripunctatus, *De Jean.* Sp. Col. 2. 280. 3.

Very much resembles *N. biguttatus*, but differs in having two rather deep punctures between the third and fourth striæ, and a little above the middle of the elytra, *biguttatus* having only one.—*(Translated from De Jean's Description.)*

Art. XXII. — *Varieties.*

(Continued from p. 93.*)*

14. *Insensibility in Insects.*—Sir, In 1828, I reared several Gypsy moths from the caterpillars: as fast as the moths appeared, I pinned them on a setting-board: some of the males however got loose with the pins still in them, and joined

the females. In due time the females laid their eggs, from which I succeeded in rearing caterpillars. I beg to instance this fact, in support of the argument against insects having the same feeling as warm-blooded animals, which is given in the very interesting article, called *Colloquia Entomologica*, in your last number. WILLIAM BOND.

15. *Capture of Leptura scutellata.*—SIR, This insect may be taken in Hainault Forest, from the middle of June to the end of July, on and in the decayed stems of the hornbeam. In 1829, another collector and myself took upwards of a hundred, besides a great many caterpillars and chrysalides; both these are white: the latter as they come to maturity growing darker, particularly about the legs and antennæ.
WILLIAM BOND.

16. *Locality and habit of Clytus arcuatus.*—SIR, These insects are also taken in Hainault Forest in June, on the trunks of felled oak-trees, particularly those which are not stripped of their bark: they run very quick, and are difficult to capture, concealing themselves in the chinks of the bark, or dropping down into the grass as soon as they perceive your approach. They only appear when the sun is very hot: the males are great combatants, frequently fighting until one or both have lost parts of their antennæ and legs.
WILLIAM BOND.

17. *Capture of Platypus cylindrus.*—SIR, These insects were taken by my old friend and instructor in entomology, Mr. Bydder, out of the stumps of newly felled beech-trees in the New Forest, Hampshire. In these they bore round holes, from which it is very difficult to extract them: after trying the smoke of tobacco and several other modes, he thought of pouring water on the stumps, at which they came running out in droves, and he took upwards of two hundred of them.
WILLIAM BOND.

18. *Monument to Cuvier.*—All our readers are aware of the death of this great man: in him naturalists lost the great preceptor, whose extraordinary talent and unrivalled research have made them, in some degree, acquainted with the wonderful

works of a Creator, who has made nothing in vain, and therefore nothing beneath our notice, and who has Himself pronounced his creatures to be good. The loss of this philosopher will long be felt. It requires ages to produce a Homer or a Shakspeare; and ages elapse between the lives of an Aristotle and a Cuvier. We feel that we should be rendering an acceptable service to our readers, by giving some account of the life of this great man: our limits preclude it. His countrymen, with that fine taste for which they are so remarkable, have planned a monument to his memory, the expense of which is to be defrayed by the sale of works on any branch of natural history, which their respective authors are invited to transmit to agents appointed to receive them; first, however, writing their own names in each, and some short observation, demonstrative of their respect for the deceased. We call on our countrymen to assist in such an undertaking; let not Britain be behind other nations in demonstrating esteem for sterling merit. M. Baillière, 219, Regent street, is appointed one of the agents to receive and transmit such works.—Ed.

19. *Capture of Polypogon derivalis.*—Sir, I perceive it is your intention to devote a page or two of your magazine, to record the capture, &c. of rare insects: I therefore transmit to you the following account of the capture of that scarce Lepidopterous insect—*Polypogon derivalis.* On the 9th of last August, I took one specimen in Collyer's Wood, Green Hithe, Kent; I believe it is only the second specimen that has been taken for nearly thirty years: the other was taken at Birch Wood, about three years since, and is now in the cabinet of Mr. Bentley. J. Chant.

20. *Cause of Sound emitted by Cychrus rostratus.*—Sir, Among the comparatively small number of insects which have the power of emitting voluntary sounds, *Cychrus rostratus* has long been known; but I am not aware that the manner in which it produces its sound, has ever been correctly described. Neither Curtis nor Stephens allude to it at all. Mr. Kirby says, "Two other Coleopterous genera, *Cychrus* and *Clytus*, make their cry of *noli me tangere*, by rubbing their thorax against the base of the elytra;" and the form of these parts, in *Cychrus*, seems such as might justify the opinion. An addition

may sometimes be thus made to the noise; but the principal effect is otherwise caused. The insect, when disturbed or alarmed, utters a low, angry, hissing sound, distinctly audible at some distance. On the inner edges of the inflexed margins of the elytra, are two small grooves, extending from near the base, to within a line or two of the apex, where they rather suddenly expand. The lateral edges of the plates which cover the under side of the abdomen, are, when at rest, lodged in these grooves; and it is by their friction, (particularly of the last segment but one, which works in the widest part of the grooves) that the sound is produced. An imitation of it may be made, by rubbing the edge of a piece of stiff paper in the channel. Yours, &c.

Bridgnorth, Nov. 22, 1832. THOMAS MARSHALL.

21. *Capture of the Larvæ of Deilephila Elpenor.*—During a visit to Chelmsford in August last, I was fortunate enough to meet with twelve larvæ of *Deilephila Elpenor*, feeding on *Galium palustre*, among the flags and rushes by the river side.

They varied greatly in size as well as colour, some being dark brown, marked with black streaks and ocelli on each side of the thorax, and others of a beautiful green with similar markings. This difference in colour I since find is considered by some authors as showing the distinction in sex. On bringing them home, I was unable to procure *Galium palustre*, and therefore tried them with *Epilobium angustifolium*, and other plants, on which they commonly feed on the continent. In place of one of these, *Impatiens noli tangere*, I offered them the American *Impatiens biflora*, on which they fed voraciously, and soon attained their full size.

Understanding from my friend, Mr. Newman, that the larvæ of some species of *Deilephila* change under dead leaves, &c. on the surface of the earth, I placed some thin pieces of turf in the cage, under which they immediately crept, and completed their metamorphosis. The larvæ of *Deilephila Elpenor* are remarkable when feeding, for the extraordinary elongation of the head, resembling a snout, a character I understand peculiar to some individuals of this genus, of which this is the only species I have seen in the larva state.

Shortly after the discovery of these larvæ, I had a very fine

one of *Acherontia atropos*, brought me by a green-grocer's boy in the neighbourhood.

WM. CHRISTY, Jun.

Clapham road, Nov. 1, 1832.

22. On the different appearance of Insects in different localities and Seasons.—SIR, I feel some hesitation in requesting the favour of your inserting the following, as I cannot even call myself an entomologist, and am about to ask for, not give, information. I am, however, somewhat encouraged to do so, when I see your first number is not entirely devoted to Latin monographs and reviews of entomological works; but contains some papers, which will be read with pleasure by many as unentomological as myself, and indeed, I think, by most interested in the study of natural history.

I have often observed a difference in the insect inhabitants of our counties, and wished to ascertain its cause, without being able to do so: I allude more particularly to butterflies, and some other kinds most likely to attract the notice of a casual observer; some of which are comparatively common in one district, being never or but seldom met with in another. I could not attribute it to the slight difference of temperature, produced by variety of elevation or soil, even in the instance of those warmth-loving creatures, butterflies. Some remarks of one of your correspondents, G. Wailes, Esq. of Newcastle, show, however, I think, that the fact has not escaped the notice of entomologists. Mr. W. indeed, seems to assign a very probable reason for it: after observing, "he is persuaded the connexion between geology, entomology, and botany, especially the two former, has not been sufficiently attended to;" he adds, "a good idea may be formed of the insects likely to be found in any district, if its geological features are taken into consideration." I cannot but think this is likely to be the case. The intimate connexion between the strata and vegetation of a country is well known; the nature of the soil exerts an influence in our hedge-row flowers, as well as on our forest trees. From the great variety of the soil of our island, we naturally expect to find, what in each we do observe, a variety in its *flora*: and since many, perhaps it is not too much to say all plants have their peculiar insect inhabitants, we may probably, as the same writer says, from attention to the prevailing

strata, form a good idea of the insects most likely to occur in any district.

Perhaps you or some of your correspondents may also be able to inform me the cause of the difference which in different years is observable in the brightness of colour and size of insects of the same species; most must have noticed how much finer and more beautiful butterflies are some summers than in others,—can this be at all owing to the nature of their food when in the caterpillar state? As the wet or drought of various seasons so much affects vegetation, bringing plants to perfection or stunting their growth, it may perhaps render them more or less nutritious to the insect tribes to which they afford sustenance. It is supposed, and perhaps with reason, that the nature of their food exerts a decided influence on the colour and size of the higher animals;—why may it not affect in the same way creatures so much more frailly-formed?

Any information in a future number on these subjects, which are probably well understood by the initiated in your pleasing science, would, I believe, be interesting to many of your readers besides myself,

And oblige yours, &c. Y.

Ludlow, Nov. 10, 1832.

23. *Ignis Fatuus.*—"This appearance has been strongly surmised to be a luminous insect. It is many years since the similarity of its motion was observed to that of an insect avoiding pursuit. A subsequent examiner has stated, that he approached one near enough to see distinctly the form of an insect, with wings like a dragon fly. Two or three years ago, an anonymous article in a country paper announced, that some person, in digging up the mud of an old pond, had discovered two creatures, which he surmised to be the insects in question, and which he described as looking like cray-fish with wings. The Entomologist, who can ascertain the fact, by securing an *Ignis Fatuus* in a bottle, will have drawn a tooth from the jaws of superstition and human suffering."—*From the Westminster Review for October*, 1832.

We shall feel much obliged by any information our correspondents may be able to furnish us with on this subject. Is the insect in question the mole-cricket? Our readers will bear in mind that we want facts only; we have theories on the subject in abundance.—Ed.

ENT: MAG: Jan.y 1833.

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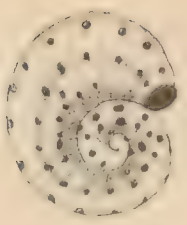


E.Newman del.

T.Ingall sc.

Fig. 1.

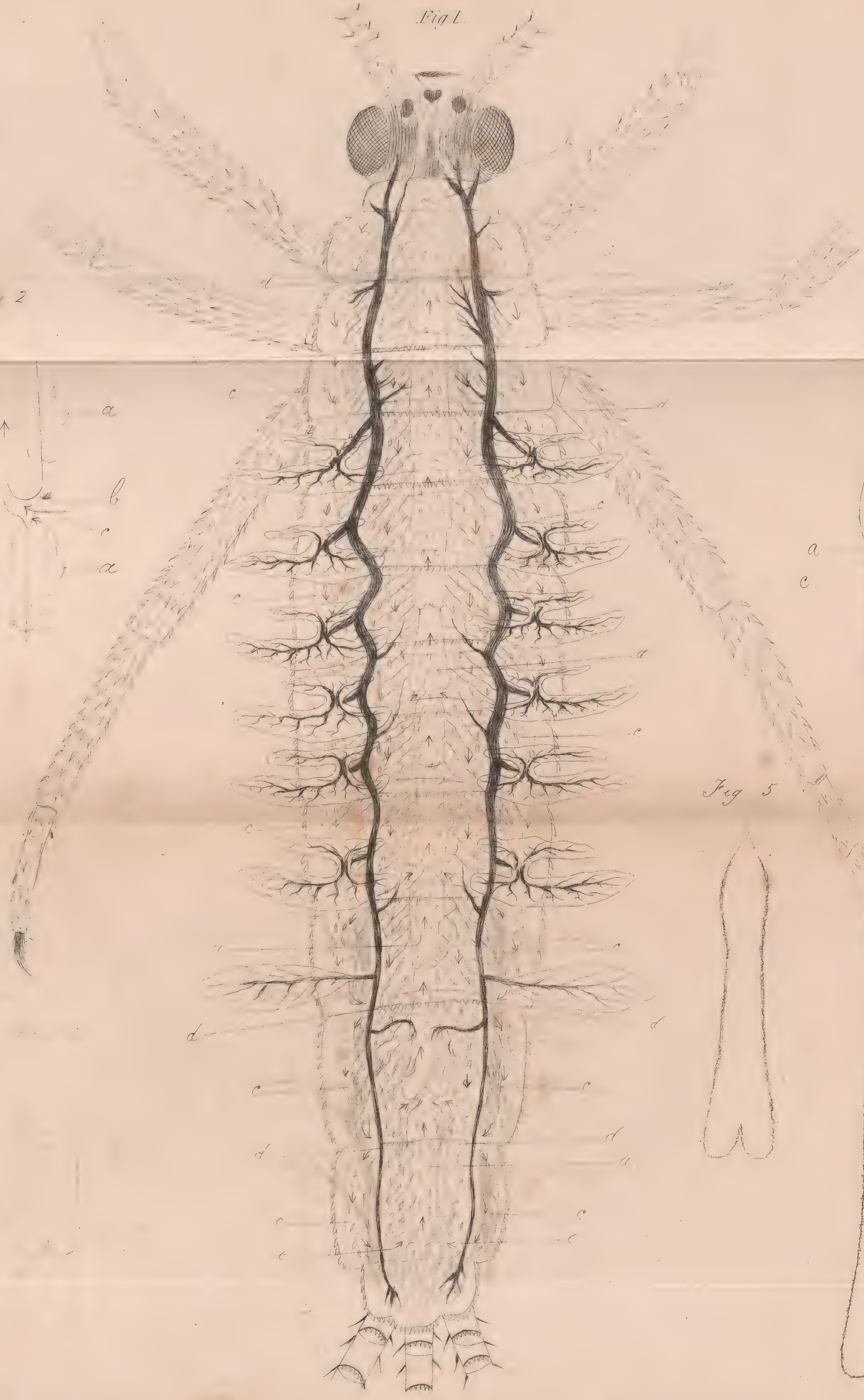


Fig 2

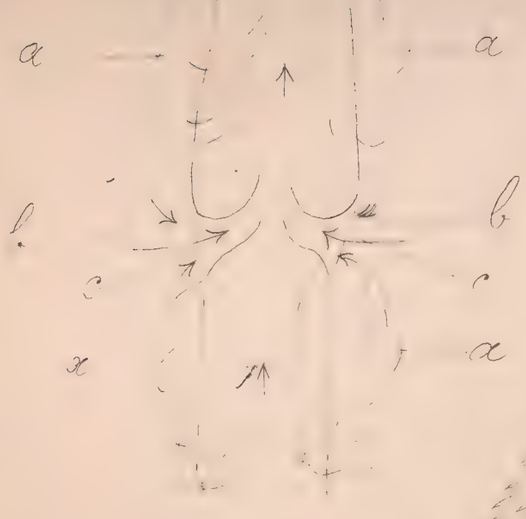


Fig 4

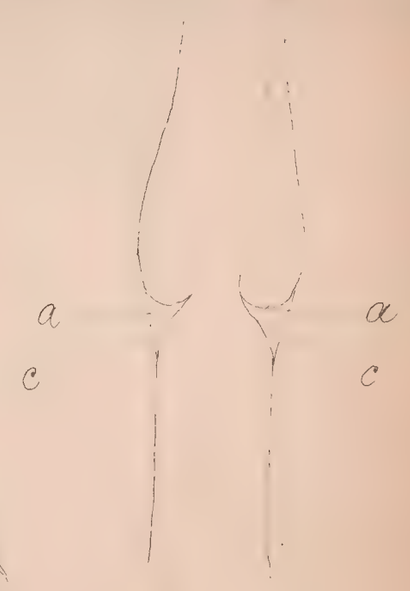


Fig 5

Fig 6

THE

ENTOMOLOGICAL MAGAZINE.

APRIL, 1833.

Art. XXIII. *Observations on Blight.* By Rusticus.

Sir,—I have another little rascal that eats my apples and pears; but, as I have not made myself master of his history, I will leave him over for another summer for examination; he eats down the stalks of the pears, particularly when they are about the size of gooseberries, and causes them to tumble down by hundreds: I dare say I shall find him out by and by, and in the meantime, I will give some account of the regular blight—the true blight—the only insect which I will acknowledge to be blight.

The true blight, or *Aphis*, is a quiet, dull, stupid looking insect, mostly without wings, but sometimes it has four, two of which are much larger and longer than the other two, and fold over and hide them, reaching beyond the body and meeting together behind it; these wings are generally as clear as crystal, with a few veins in them, yet if you hold the insect in the sunshine, and examine him through a glass, you will find they take all the colours of the rainbow; you will also find he has a long trunk or sucker, which is used as a pump or syphon, through which the sap of plants is drawn. I have sometimes seen this sucker so long as to pass under the breast and legs, and reach a considerable distance behind the body, but it is not generally so. All blights infest the young and juicy shoots, and leaves of plants, for the purpose of sap-sucking; and the plants honoured by their operations

forthwith play the most amusing and incredible vagaries; bearing blossoms instead of leaves, leaves instead of blossoms; twisting into corkscrews stems which ought to be straight, and making straight as sticks those which, as the scarlet-runner and hop, ought to twine; sometimes, as in the peach, making the leaves hump up in the middle, and causing the tree to look as though it had a famous crop of young fruit; making apple-trees bear blossoms on their roots, and causing roots to grow out of their young shoots; and, by tormenting orchards in this way, preventing the fruit from ripening, and making it woolly, tasteless, and without juice. Our china-asters often owe a good deal of their beauty to these vermin; they act as a spur to make them blossom beyond their strength and nature, and then die off without bearing seed. It is amusing to see with what regularity the blights station themselves on the young shoots of the guilder-rose, crowding so close together that not a morsel of the rind is to be seen, and not unfrequently forming a double tier, or two thicknesses; the poor sprig losing its formal unbending upright position, and writhing itself into strange contortions.

Blights are of all colours, but green is their most fashionable hue; those of broad-beans are black as soot, and velvety,—and these, if attended to, do but little harm; they cluster at the very top, and each bean should be topped just below the blight, and the top carried away and burnt,—not thrown on the ground,—or else they are sure to climb up the bean-stalks again, and, stopping here and there at the best landing-place, increase and multiply, and soon cover the whole plant; nor should they be buried in the ground, for they take care to outwit you by living underground for months, and when the gardener's spade turns them up again, they make for the beans directly: the plan of topping the beans does not injure the crop, but, if carefully done, rather improves it. The blight of the willow is very large, and, at first sight, looks greyish, but under a glass is beautifully variegated with black and white; when crushed it gives out a deep blood-coloured die, which stays on your hand several days in spite of frequent washings.

I have taken a good deal of pains to find out the birth and parentage of true blights; and for this purpose have watched, day after day, the colonies of them in my own garden, and single ones which I have kept in-doors, and under tumblers

turned upside down; the increase is prodigious; it beats every thing of the kind that I have ever seen, heard, or read of. Insects in general come from an egg,—then turn to a caterpillar, which does nothing but eat,—then to a chrysalis, which does nothing but sleep,—then to a perfect beetle or fly, which does nothing but increase its kind. But blights proceed altogether on another system:—the young ones are born exactly like the old ones, but less; they stick their beaks through the rind, and begin drawing sap when only a day old, and go on quietly sucking away for seven or eight days; and then, without love, courtship, or matrimony, each individual begins bringing forth young ones, and continues to do so for months, at the rate of from a dozen to eighteen every day, and yet continues to increase in size all the while; there seem to be no males, no drones,—all bring forth alike. Early in the year these blights are scattered along the stems, but as soon as the little ones come to light, and commence sap-sucking close to their mother, the spaces get filled up, and the old ones look like giants among the rest,—as here and there an ox in a flock of sheep; when all the spare room is filled up, and the stalk completely covered. The young ones, when they make their first appearance in the world, seem rather posed as to what to be at, and stand quietly on the backs of the others for an hour or so; then, as if having made up their minds, they toddle upwards, walking on the backs of the whole flock till they arrive at the upper end, and then settle themselves quietly down, as close as possible to the outermost of their friends, and then commence sap-sucking like the rest; the flock by this means extends in length every day, and at last the growing shoot is overtaken by their multitude, and completely covered to the very tip. Towards autumn, however, the blights undergo a change in their nature, their feet stick close to the rind, their skin opens along the back, and a winged blight comes out—the summer generations being entirely wingless. These are male and female, and fly about and enjoy themselves, and, what seems scarcely credible, these winged females lay eggs, having first lived through the winter; and whilst this operation is going on, a solitary winged blight may be observed on the under-side of the leaves, or on the young shoots, particularly on the hop, and differing from all its own progeny, in being winged and nearly black, whereas its young are green and

without wings. These are mysteries which I leave you entomologists to explain. In May, a fly lays a lot of eggs; these eggs hatch and become blights; these blights are viviparous, and that without the usual union of sexes, and so are their children and grandchildren,—the number of births depending solely on the quantity and quality of their food: at last, as winter approaches, the whole generation, or series of generations, assumes wings, which the parents did not possess, undergoes frequently a total change in colour, and in the spring, instead of being viviparous, lays eggs.

To this singular tribe belongs the hop-fly, an insect which has more rule over the pockets and tempers of mankind than any other; its abundance or scarcity being the almost only criterion of a scarcity or abundance in the crops of hops: and of every article of merchandize the hop is consequently the most liable to variation in price. Owing to the interest taken in the crop of hops, much more close attention has been paid to the hop-fly than to any other insect; and you find men conversant in its habits, who would blush if you were to suppose them possessed of enough natural history to know the name of the commonest beetle or even bird; but let me assure these, that there is nothing derogatory to their manhood, their common sense, or their dignity, in knowing something of the works of nature; I never met with an individual who was the worse man for it. I don't myself go the length of some of your contributors, who measure the joints of an insect's *ears*, as Professor Rennie, I see by your Magazine, has called them. But, perhaps, even this is necessary to acquire an accurate knowledge of each kind.

The hop counties are Kent, Sussex, Surrey, Worcester, and Hereford. The produce of these are termed, on the market, Kent, Sussex, Farnham, and Worcester hops. The Farnham are invariably the highest priced, and the Sussex the lowest. The Worcester hops never come on the London market, and have a price of their own, which is not much influenced by the general price, as no hops are ever, or very rarely indeed, introduced to supply a deficiency of the

[a] I should judge, from the asinine and blundering stupidity of Professor Rennie's compilations, that he is peculiarly elongate in this organ; and so, from the similarity of his own ears to antennæ, infers a corresponding use in the two different kinds of organs.—RUSTICUS.

Worcester crop, should that fail. The hop affords scope for the speculator in two ways: first, the hop itself; and, secondly, the hop-duty; the last is the subject of betting to a very large amount annually. The old duty on hops is 10*s.* 8*d.* per cwt.; the new duty, imposed in 1802, is 12*s.* 7*d.*; making, with the fractions, 23*s.* 4*d.*; in 1805, 4*s.* 8*d.* per cwt. was reduced; so that the actual duty paid is 18*s.* 8*d.* per cwt. In betting on the duty, the old duty is always understood; and so generally adopted is this plan of expressing the probability of a crop by the betted duty, that the common question is, "What is the duty laid at?" and as the duty falls, the price of hops, of course, rises; and *vice versâ*. This duty is however too much guided by a few men in the Borough, who frequently rise and fall it to answer their own purposes; yet, as the day of picking approaches, the near correspondence of the betted duty and the old duty actually paid, is truly surprising. In the year 1802, on the 14th of May, the old duty was laid at 100,000*l.*; the fly, however, appearing pretty plentifully towards the end of the month, it sunk to 80,000*l.*; the fly increased; and, by the end of June, the duty had gone down to 60,000*l.*; by the end of July, to 30,000*l.*; by the end of August, to 22,000*l.*; and by the end of December to 14,000*l.*; the duty actually paid this year was 15,463*l.* 10*s.* 5*d.* In 1825, the duty commenced at 130,000*l.*, but, owing to the excessive increase of the fly, had in July fallen to 16,000*l.*; at the beginning of September it rose to 29,000*l.*, but towards the end fell again to 22,000*l.*; the amount paid was 24,317*l.* 0*s.* 11*d.* In the following year, the summer was remarkably dry and hot; we could hardly sleep of nights with the sheets on; the thermometer for several nights continued above 70° all the night through: the crop of hops was immense, scarcely a fly was to be found, and the betted duty, which began in May at 120,000*l.*, rose to 265,000*l.*; the old duty actually paid was 269,331*l.* 0*s.* 9*d.*; the gross duty, 468,401*l.* 16*s.* 1*d.*, being the largest amount ever known. From this it will appear that, in duty alone, a little insignificant looking fly has a control over 450,000*l.* annual income to the British Treasury; and supposing the hop-grounds of England capable of paying this duty annually, which they certainly are, it is very manifest, that in 1825, these creatures were the means of robbing the Treasury of 426,000*l.* This seems a large sum, but it is not

one-twentieth part of the sums gained and lost by dealers during the two years in question.

The hop-fly makes its first appearance generally about the 12th of May, sometimes two days earlier, but almost invariably between the 10th and the 30th; and it is worth noticing, that it usually appears on the same day in the four districts of Kent, Sussex, Farnham, and Worcester. It always makes its first appearance in the winged state, a solitary fly being found settled very quietly here and there under the young leaves. If the weather is warm, with mild kind rains during the last twenty days of May, these flies begin to produce young ones, which are very small, and are called *deposit*, or *knits*. These grow very fast, and in a few days become green *lice*, which is merely a larger form of the same animal. These lice very soon begin to breed, and so keep on, knits and lice, knits and lice *only*, to so great an extent as to destroy the plant, when they appear to die with it. I have never found that the deposit of the hop-fly leaves the plant at all, or ever becomes a fly while there; in this respect differing from the *Aphis* of the rose, guilder-rose, bean, &c., of which I have spoken above. Frequently, when the weather in May has been dry, and cold, and windy, the fly has been known to leave the plant, and entirely disappear, even after remaining several days; yet whilst it tarried showing very evident signs of being uneasy, continually crawling about on the upper as well as under side of the leaves, and leaving no deposit whatever. The direction of the wind has nothing whatever to do with their first appearance, but in a warm westerly wind they will take flight most readily, and be thus distributed. The lice, when half grown, change the skins; and I have often found the skins of very large ones stuck to the leaves, and yet showing no opening where the insect could have got out. I believe these are the prey of a little parasitic fly, whose history I don't know enough of at present to attempt to give it you here; they have, however, other enemies; and as these seem to offer the only hope of checking the increase of these destructive wretches, I shall give you a little account of them.

You will never find a plant of any kind infested with the *Aphis*, without also observing a number of ants and lady-birds among them, and also a queer-looking insect, like a fat lizard, which is in fact the caterpillar of the lady-bird. The connexion

of the ant and the *Aphis* is of the most peaceful kind that can be conceived; their object is the honey-dew which the *Aphis* emits; and, far from hurting the animal which affords them this pleasant food, they shew it the greatest possible attention and kindness,—licking it all over with their little tongues, and fondling it, and patting it, and caressing it with their antennæ in the kindest, prettiest way imaginable:—not so the lady-bird, or its lizard-like caterpillar; these feed on the blights most voraciously, a single grub clearing a leaf, on which were forty or more, in the course of a day. The perfect lady-bird is a decided enemy to them, but not so formidable a one as the grub. The eggs of the lady-bird may often be seen on the hop-leaf; they are yellow, and five or six in a cluster placed on their ends; these should on no account be destroyed, as is too often the case, but on the contrary every encouragement should be given to so decided a friend to the hop-grower.

Besides the lady-bird and its grub, there are two other terrible enemies to the poor *Aphis;* one of which is a green ungainly-looking grub, without legs, which lays flat on the surface of the leaf, and stretches out its neck, just like a leech, till it touches one of them; directly he feels one he seizes it in his teeth, and holds it up, wriggling in the air till he has sucked all the goodness out of it, and left it a mere empty skin. This curious creature turns to a fly which has a body banded with different colours, and which in summer you may often observe under trees and about flowers, standing quite still in the air as though asleep, yet, if you try to catch him, darting off like an arrow.[b] The other has six legs, and very large strong curved jaws, and is a most ferocious looking fellow, strutting about with the skins of the blights which he has killed on his back. This fierce fellow comes to a very beautiful fly, with four wings, all divided into meshes like a net, and two beautiful golden eyes.[c] All these creatures, which thus live on the plant-lice, have a very strong and disagreeable smell in the perfect state.

For a favourite plant infested with blight there are several remedies,—smoke of tobacco, snuff, &c.; but the most effectual, and the least hurtful to the plant, is to let it stand in a

[b] One of the *Syrphidæ*. Vid. Int. to Ent. I. 265, &c.—Ed.

[c] *Chrysopa Perla*.—Ed.

tank of cold water for half an hour, when all the blights will leave it and swim on the surface of the water. For hops, none of these plans are available; and, unless a way could be discovered of increasing the number of the blight-eaters, I fear the chance of discovering a remedy is very small.

Your's, &c. RUSTICUS.

Godalming, Sept. 16, 1832.

ART. XXIV. — *Opinions on* MR. NEWMAN'S *Sphinx Vespiformis.*

1. *Comments on Sphinx Vespiformis.* By SCRUTATOR, F.R. & L.S.
2. *Notes upon the Natural System, &c.* By I. O. WESTWOOD, ESQ., F.L.S., &c.
3. *Observations on the Newmannian or Septenary System.* By CLERICUS.[a]

1. *Comments on Sphinx Vespiformis, &c.* — SIR, Your review, at p. 44 of the Magazine, has made me acquainted with one of the most delightful books I ever read; and as a few ideas have occurred to me which I noted down on perusing it, on subjects which you have passed over in silence, I shall feel greatly obliged if you will make them public; and if they tend to correct minor errors, and at the same time promote the circulation and reception of Mr. Newman's opinions, they will answer the end for which I have intended them.

I will begin with what I consider the errors of *Sphinx Vespiformis,* and then pass to the more pleasing task of pointing out its merits, taking care not to interfere with anything you have said, or to give an opinion where you have already expressed one. In the first place, I would suggest

a We are reluctant to occupy so much space with anything in the shape of retrospective criticisms; but so great has been the interest that has been lately excited on the subject of arrangement, that we doubt not these opinions will be read with considerable interest.—ED.

that for the division below *class* there is a great impropriety in the use of the word *subclass*; first, because Mr. MacLeay has already given the name *stirps* to precisely the same division; and secondly, because the adoption of all *sub*-divisions implies either a poverty of thought or a degree of carelessness, quite inadmissible in a work like Mr. Newman's. In the next place, the adoption of a generic name, as a designation of such *subclass*, is an error quite as inexcusable, as the same writer has proposed the elegant termination *ina* for the designation of his *stirps;* and besides, a perpetual confusion would arise from the use of the same name for two groups so very different in their importance. These alterations are not proposed on the thought of a moment, still less are they laid before you in that petty, and to me excessively disagreeable, spirit of criticism which I have so often seen displayed in some of our scientific periodicals. Greatly grieved indeed shall I be, if I am considered as holding out a precedent for such paltry fault-finding; and I would much rather that you suppress this, as you did my last (of which I do not complain), than see your Magazine, or any portion of it, allotted to the petty and jealous criticisms of those who have neither the research nor ability to furnish original papers.

The returning to the term *Class* for the *Orders* of Linné, and the proposition of *Natural Orders* equivalent to those in use in botany, are two grand steps in entomology; and let me press upon their author the great necessity there is for immediately following up so important an alteration, or he may depend on being anticipated in the task by some aspirant for fame, eager to place his name after a series of his own *natural orders;* and let me remind Mr. Newman, that these names, however inappropriate, or however ill-judged the divisions to which they are applied, must stand by the now universally received law of priority.[b] On referring to my Kirby and Spence, I find no division has been so variously denominated as the *class* of Mr. Newman; *class*, *tribe*, *section*, *order*, *division*, &c., have been applied to it; but class has the double claim of priority and appropriateness. Linné has made sad havoc with his *orders*, in applying the

[b] We do not ourselves attach the value to this *naming* that some of our contemporaries seem to do. We frequently see appended to new genera and species names which are utterly unknown in science.—Ed.

term to three groups of very different degrees of importance. Let me observe also, in this place, how completely the chicanery, the mystification of natural history, is removed by Mr. Newman's plan. *Class, Stirps, (Subclass,* N.*) Order, Family, Genus, Species,* are all the divisions which will now be required; and such terms as *Lepidoptera, Tineina, (Tinea,* N.*) Tortices, Halias, Fagana,* all old acquaintances, are alone to be applied as names to such divisions. I would entreat your readers to compare this series of names with the divisions and subdivisions proposed even by that prince of British entomologists, Mr. Kirby, in the Introduction to Entomology, a mass of names which, if carried through the system, no human life would be long enough to acquire—no human memory powerful enough to retain.[c]

It is with a feeling of proud satisfaction that I look back on the labours of my fellow-countrymen in that highest department of Physics, the just and natural arrangement of animated beings. Writers on system are of two distinct clases; and though each may pursue his inquiry by analysis or synthesis, accorded to his own peculiar views, or rather the peculiar constitution of his mental faculties, yet neither ever oversteps the line of demarcation, or if he attempt to do so that attempt is sure to be unsuccessful. One of these classes, comprehending at a view the whole expanse of nature, strives to mould her according to some vast and preconceived idea; the other aims at placing each species, genus, and family, in its proper situation as regards its neighbours, being perfectly indifferent to, or considering of but small importance, the uniformity of the whole. The first class of these systematists, however they may dislike the appellation, must be called theoretical; the second are practical. The theorists certainly take the higher ground, but must ever be indebted to the practical naturalists for the facts from which their own deductions have resulted. In the first class we have had, in this country, MacLeay and Newman. In the second, Leach and Stephens.[d] Between the views of two of these writers I shall now attempt to prove a very striking similarity, in which, if I succeed, I think it

[c] Introd. to Ent. Vol. IV. p. 402.—Ed.

[d] Our correspondent must confine himself to entomology, or he could never omit the great names of Ray, Lister, &c. among our ancestors, and our illustrious contemporary Swainson.—Ed.

follows, that both of them have made a very near approach to truth.

My friend Stephens appears to have followed Clairville's binary division of insects, more for the sake of convenience in publishing than from any conviction of its worth. It is scarcely possible that a comprehensive mind like his should attach any value to a theory so fantastical; but, having adopted it, consistency compels him to adhere to it, and forces him into the most obvious errors. I presume it to be known to all your readers, at least all who will trouble themselves with the perusal of these remarks, that Mr. Stephens divides insects into two groups: I. *Mandibulata*, comprising seven orders, 1. *Coleoptera*, 2. *Dermaptera*, 3. *Orthoptera*, 4. *Neuroptera*, 5. *Trichoptera*, 6. *Hymenoptera*, and 7. *Strepsiptera;* and II. *Haustellata*, including likewise seven orders, 1. *Lepidoptera*, 2. *Diptera*, 3. *Homaloptera*, 4. *Aphaniptera*, 5. *Aptera*, 6. *Hemiptera*, and 7. *Homoptera;* that each seven orders form the circumference of a circle, and that the two circles touch or approach at the orders *Trichoptera* and *Lepidoptera*. The errors are in the combination of the seven Haustellate orders. The intervention of *Aphaniptera* (an order of which the flea[e] is the only example), between the pupiparous *Homaloptera* and the ametabolous *Anoplura (Aptera)*, is extravagant and capricious in the extreme, and will not bear a moment's investigation; the flea is closely allied to the Dipterous genus, *Micetophila*, both in the final structure and metamorphosis, but is very far removed from either of the groups between which it stands; the *Anoplura*, (for I must thus call them, although I see the term *Aptera* misapplied to them), have no right whatever among true insects, whose main distinguishing and unvarying character it is to have a distinct triple metamorphosis, whilst in these the change has dwindled to a mere ecdysis. The same fault

e We have just received M. Audouin's *Annales des Sciences Naturelles*, for October, 1832, in which M. Dugés, in a paper on the structure and affinities of the flea, has, we think, incontrovertibly proved its natural situation to be between the orders Diptera and Hymenoptera, thus also shewing that those two orders are very nearly allied. The position assigned by M. Dugés to the other winged insects tends to prove the accuracy of our valued correspondent's views, and also to demonstrate the very near approach to a natural system made by Messrs. Stephens and Newman.—Ed.

does not apply to the orders of *Mandibulata*, which seem to be perfectly natural in their arrangement; but to require, as well as the *Haustellata*, some reduction in their number.

The French entomologists have ascertained, by dissection and profound investigation, that the orders, *Homoptera*, *Trichoptera*, and *Dermaptera*, are not anatomically to be distinguished from the orders from which they have been separated, *Hemiptera*, *Neuroptera*, and *Orthoptera;* and we must ever bear in mind, that these philosophers have no theories either to oppose or support, and have arrived at their conclusions on purely scientific grounds, unbiassed by any other motives than the highly praiseworthy ones of satisfying themselves, instructing their pupils, and promoting science. *Strepsiptera* is obviously of less importance than the others.

The author of "Sphinx Vespiformis" limits his classes to the number seven; six of these, 1. *Lepidoptera*, 2. *Diptera*, 3. *Hymenoptera*, 4. *Coleoptera*, 5. *Orthoptera*, 6. *Hemiptera*, are arranged around the circumference of a circle, the centre of which is occupied by the seventh, *Neuroptera*. I am by no means inclined to attach any great value to a particular number, or to the cabalistic regularity of a diagram; on the contrary, I do not imagine that any number is universally prevalent through nature; but in this particular instance I do believe, and I think no reasonable person will deny, that the number seven is most apparent and most appropriate. In inferior divisions the number two is remarkably conspicuous; as in *Lepidoptera*, butterflies and moths; in *Diptera*, gnats and flies; in *Hymenoptera*, the provident and the parasite insects; in *Coleoptera*, the carnivorous and the herbivorous; in *Orthoptera*, the jumpers and the runners; and in *Hemiptera*, the Homopterous and Heteropterous tribes: but I am neither capable nor desirous of entering on this discussion at present; my object is to show the similarity between the conclusions of a practical and a theoretical systematist.

Allow me then to submit a view of Mr. Stephens's orders, printing those which appear to me ill-placed in italics; those which the French entomologists have decided to be untenable, and *Strepsiptera* as being of less value, in small Roman characters; and those which appear good orders, and in their place, in Roman capital letters; and below this to place Mr. Newman's in the position in which he places them, leaving

the numbers before each, as applied by the respective authors, to show that, on my part, there has been no alteration of position.

STEPHENS.

I. LEPIDOPTERA.

VII. Homoptera. II. DIPTERA.
VI. HEMIPTERA. III. Homaloptera.
V. *Aptera.* IV. *Aphaniptera.*
IV. NEUROPTERA. V. Trichoptera.
III. ORTHOPTERA. VI. HYMENOPTERA.
II. Dermaptera. VII. Strepsiptera.

I. COLEOPTERA.

NEWMAN.

I. LEPIDOPTERA.

VI. HEMIPTERA. II. DIPTERA.

VII. NEUROPTERA.

V. ORTHOPTERA. III. HYMENOPTERA.

IV. COLEOPTERA.

Can this similarity be the effect of chance? If one man set out from Dover on foot, and another from Holyhead, and walked to London by these two opposite roads, would their meeting in London be the effect of chance? No one would be so hardy as to assert so; and yet I have heard those to whom I have pointed out the above similarity assert, that it was a matter of chance; that Mr. Stephens did not ever intend the orders to be placed as I have placed them. I grant that: the relative position he proposes for the orders is not, by any means, so consistent with the contents of the body of his work as the one I propose; the only difference I have ventured, is, that I begin with the *Lepidoptera* because Mr. Newman has done so, and because also that by so doing I do away with the very outrageous connexion between the two

tribes of orders at *Stylops* (783), and *Papilio* (784), a connexion resulting from accident, and certainly never for a moment entertained by the author as natural. And I would willingly inquire of Mr. Stephens himself, whether the position in which I have placed his orders is not more in accordance with his own observations of affinities, than the one which he has himself proposed.

It is undeniably a sound argument in favour of the truth of the septenary system, that it so very well agrees with the arrangement of a Catalogue, composed by an author pre-eminently qualified for the task, and who had no peculiar views of system which could induce him to alter the position of any group, having once decided on that position by a close investigation of characters.

In the next place, it is just to infer that, if one group contains insects closely allied to insects in each of three other groups, that group cannot be placed naturally without touching all the other three; and not binding myself to the instances proposed by the author of "Sphinx," which I consider are far from being the best he could have selected, I shall select others; for instance, the Neuropterous insects, *Perla*, *Psocus*, and *Tinodes*, with *Acheta* (the common cricket), *Aphis*, and any of the tribe *Tinea*; and let not any one who is disposed to make the inquiry shrink from a close scrutiny, — consulting and comparing the mouth, antennæ, thorax, wings, legs, abdomen, and even the appendices of the abdomen; and if, after the examination, he does not find an affinity between *Perla* and *Acheta*, between *Psocus* and *Aphis*, and between *Tinodes* and *Tinea*, and consequently draw from this the conclusion that *Neuroptera* is related, and very closely, to *Orthoptera*, *Hemiptera*, and *Lepidoptera*, then certainly there is nothing in any affinities which are now allowed. For my own part, having, during the present month, turned my attention almost exclusively to this interesting subject, I have found exotic genera in *Diptera*, *Hymenoptera*, and *Coleoptera*, nearly as closely allied to *Neuroptera* as the instances above given for the other classes; but these are at present little known, and therefore may induce doubt and discussion; and I rest my argument solely on the affinities which I have already pointed out; and maintain that, to arrange the four classes in question naturally, they must touch each other where those genera

occur, and this can only be accomplished by placing them as Mr. Newman has placed them.

Lastly, I turn to what I consider the greatest of modern discoveries in natural history, viz. the existence of central types; and on this subject I must remark, that I think Mr. Newman has very injudiciously selected the most difficult and intricate part of the whole system for the exemplification of his theory; and in this he seems to rejoice, and to hew down and trample on the labours of the numberless industrious drudges who have been, so long and with such little success, toiling in the same path; the cavalier-like manner in which these, the ladders by which he has mounted, are thrown down, may, perhaps, be supposed indicative of conscious superiority, but certainly not of that kind and indulgent feeling which every naturalist ought to entertain towards his fellow-labourers; nor can I hold it in any way safe or creditable to one who stands himself upon a slippery place. The *Carabi*, the *Staphylini*, the *Dytici*, present groups in which, from their excellently described distinctive character, the number of their species accessible in cabinets, and from the little necessity there is of reverting to their larvæ, might readily be made useful in pursuing an inquiry of this kind; but the *Phalænæ* have very few characters, and these ill-recorded or almost undiscovered, and the accessible species are very limited and principally unnamed. How far Mr. Newman has succeeded in his conclusions from these, I am not capable of deciding, but no one can doubt for an instant the existence of central types; indeed, it seems one of those obvious truths which remain for a long time hidden, and which, when discovered, astonish us by their very simplicity. I can scarcely describe the pleasure I have felt in ranging the aberrant groups round the types, *Procerus*, *Dyticus*, *Hydroüs*, *Lucanus*, &c. In my *Tenthredines* I have given *Cimbex* the centre, and have surrounded my hornet by a phalanx of wasps. These remarks may perhaps appear of little value: my object is to induce entomologists to go into the subject thus practically as I have done, and to impress on them this mathematical inference, that, granting the existence of circles, and of a central circle surrounded with others, then six is the only number that can so surround it, and the number seven consequently becomes established.

It is time for me to conclude; I fear I have already extended this letter to a length which you will consider unreasonable. In conclusion, let me say, that I consider the system proposed in "Sphinx Vespiformis" the system of nature; first, because the most capable writer of the present or any past era has placed the principal divisions in the same relative situations; secondly, because, unconfined by the "connecting links," proposed by Mr. Newman, I have discovered others incapable of refutation; thirdly, because I plainly discern the existence of centres; and fourthly, by mathematical reasons I infer seven is the number which must surround them.

Accept my best wishes for the prosperity of your Magazine, and believe me

Yours, &c.

Sept. 29, 1832. SCRUTATOR, F. R. & L. S.

2. *Notes upon the Natural System, &c.*—The establishment of a Magazine, devoted solely to entomology, appears to offer a channel through which the wish expressed by Mr. Newman, to hear the opinions of others respecting the merits of his "Sphinx Vespiformis" may be gratified; and I therefore propose to avail myself of its pages to record a few Notes, made during my perusal of it. There are various portions of the work, however, respecting which I beg to offer no opinion of my own; such as the circularity of groups, their septenary subdivision, the centrality of a typical group, or the mode of progression, hoping that these subjects will be discussed by naturalists more competent than myself to the task.

The first two pages of the "Sphinx Vespiformis" form one of the neatest introductions which I have ever met with. The small clear-winged *Sphinges* have long been objects of interest with me; and being anxious to verify the account given of the true *Sphinx Vespiformis*, I too paid it a visit, and was gratified to find that we are thus enabled to clear up the doubts which have been raised respecting the synonymy of this species, in consequence of the Linnæan description having been decidedly drawn from a rubbed specimen of the *Asiliformis* of Fabricius, Haworth, &c., (which latter name must consequently fall); and further, that the reference made by Mr. Curtis, alone, of the *Œstriformis* (or *Cynipiformis*) to the *Vespiformis* of Linnæus (which reference Mr. Newman has omitted to

notice in his *Mon. Ægeriar.*), was an extension of the confusion. I am the more willing to add my testimony upon this subject, because I perceive, from the 33d page of the first number of this Mag., that the Fabrician nomenclature has since been retained, notwithstanding its incorrectness.

I was glad to perceive (*Sph. Vesp.* p. 6) that an attempt was about to be made, in the subsequent pages of the "Sphinx Vespiformis," to discover the situation of a small group of insects, whose economy as well as structure had rendered them a very decided group amongst the species of Crepuscular Lepidoptera, with which they had been associated; having felt surprise that, in proposing the twenty-five groups into which Dr. Horsfield had distributed the five tribes of *Lepidoptera*, this most natural group had been dismissed in the following passage:—"The divisions do not embrace *Ægeria*, and several other genera, commonly arranged amongst the *Sphingidæ*, which, if my observations are correct, have a different metamorphosis, and will probably, at least in part, find a place in the next tribe," (*Bombycidæ*, divided into five forms, to one of which the name of *Lignivoræ* was given, with *Pygæra*, *Cossus*, and *Hepialus*, as its types), "but this remains for future discussion." *Lep. Jav.* p. 23. Mr. Stephens had likewise noticed the approach of the *Sphinx Apiformis* towards the *Bombycidæ*.

The corroboration of the circularity of natural groups and the existence of a central primary typical subgroup, supposed (*Sph. Vesp.* p. 13—17) to be afforded by the plan of the solar system, does not appear to me to be entitled to much weight. In like manner, is it not presumptuous in endeavouring to discover the plan according to which the Creator distributed natural objects, even to suppose that He whom the heaven of heavens cannot contain should have assigned himself a situation in a system of His creatures? And yet this is the only way in which we can construe Mr. Newman's introduction of the subject (p. 14). So also the endeavour to uphold a given number of groups in natural history from passages of Scripture, and the reference of a septenary arrangement (with one seventh superior to the others) to the result of the six days' creation and the seventh day of rest, appears equally improper. I had hoped, after the caustic remarks of Mr. MacLeay upon this subject, that naturalists would not again

have been induced to employ such arguments. "It is," says he, "a very convenient mode of getting rid of an antagonist; as they have only to raise the hue and cry against him for disputing a Bible-truth, and the affair is settled. Here, however, are an English, Scotch, and American divine quoting Scripture against each other, each for his favourite number, seven, two, and three. The Bible was intended to direct our moral conduct and religious belief. No one but a madman, a fanatic, or an interested knave, can pretend to tell us that it is an encyclopædia of science."

Setting, however, these Scriptural references aside, the idea which Mr. Newman has stated in the pages referred to, viz., that of the superiority of one of the divisions of any natural group, and *of its central situation*, is an extremely happy one and deserves much consideration; and it is worthy of observation, that Fries had, ten years ago, employed the terms *centrum* and *radii* to distinguish the typical and aberrant divisions of any groups. Mr. MacLeay, indeed, asserts that the former term did not imply the *centre* of a circle, but that site in its circumference occupied by the normal form or perfection of the particular structure common to the superior group of which it forms a part; in like manner, the term *radii* is stated by him to be applied to those groups, likewise in the circumference, which lead from one *centrum* or type to another. Although such, indeed, may be a fair interpretation of M. Fries' words, I can scarcely think that he would have employed such unequivocal terms as *centrum* and *radii*, without wishing to impress the idea of the former occupying the centre of the circle.

Mr. Newman observes, "Be the system of nature discovered when it may, it will never be found that *Appia via* which Linnæus has made it out to be, but rather like the Cretan labyrinth; and whoever may happen to be the fortunate Theseus, must undertake the task of showing the way to his competitors, until it becomes so well known that a map of the road (a systematic catalogue) may be drawn for the use of all." Let us, however, who are the disciples of this great man, be careful that not a single gem be withdrawn from his gorgeous coronet. Linnæus knew well that the natural system was very different to that artificial one set forth in his works, although he gave to the latter the name of *Systema*

Naturæ; indeed, it is rather remarkable that, in describing the former, he has employed the very expression which, in the paragraph quoted above, is set in opposition to what is called his *Appia via*: "*Plantæ omnes*," says he, in his "Philosophia Botanica," "*utrinque affinitatem monstrant uti territorium in Mappa Geographica.*" How far a continuous systematic catalogue can ever be made, to afford a clue to the intricacies of this map-like labyrinth, appears rather dubious.

Respecting the distribution of the animal kingdom (or, as Mr. Newman terms it, first primary group) into seven subkingdoms (kingdoms, *Newm.*), that gentleman has merely ventured to give a supposition, that the *Vertebrata* will be found to constitute a central seventh of all animated nature; at p. 54 (*Sph. Vesp.*) he, however, gives the *Annulosa* as another of these first divisions. So that it is evident that the remaining five subkingdoms must be formed from the residue of the unvertebrated animals; it will, however, be quite impossible to discover five such groups, which shall respectively be of equal value with the *Vertebrata* and *Annulosa*.

In like manner, the author has given no clue to his proposed septenary distribution of the Annulose subkingdom into classes (or, as he terms them, subkingdoms); it is true that he considers the insects as forming the central one of the seven Annulose classes; and he is not unwilling to introduce the *Ametabola* of Dr. Leach (*Pediculi*, &c.), into the outermost circle of the *Hemiptera*; so that his six remaining classes (or subkingdoms) must be constructed from the *Crustacea*, *Arachnida*, and *Myriapoda*; but, if such a step were adopted, it is equally evident that such six groups would not respectively be of equal value, either with his group Insecta, or even with the two divisions of insects adopted by some other naturalists, *Mandibulata* and *Haustellata*.

From the preceding paragraph, it will be seen, that the author proposes to alter the value of those higher sectional terms, which are tolerably well established; of these the term kingdom is so universally employed for animals, vegetables, and minerals, that the innovation appears neither warranted by necessity nor good taste. So also, in p. 21, he informs us that he has invariably used the term class to designate the orders of Linnæus. If entomologists of all countries are

agreed upon any one point of nomenclature, it is in preserving for the *Coleoptera*, &c. the name of orders. What possible benefit does the author suppose can arise, by thus transposing and altering well-established sectional names? With myself, at least, confusion has been the result; since whilst studying the pages of the "Sphinx Vespiformis," I was constantly tripping over the misapplied terms, kingdom, class, order, &c. I trust entomologists will set their faces against the attempted innovations.

Yours, &c.

The Grove, Hammersmith, Oct. 1832. I. O. WESTWOOD.

(To be continued.)

3. *Observations on the Newmannian, or Septenary System.*—SIR, I conceive it to be my duty to send you my opinions on the subject which has lately engrossed so large a portion of the attention of the scientific naturalists of this country. I need not say you are at liberty to publish my opinions, or not, as you may think fit; but I appeal to you, as Editor of a scientific magazine, whether such a magazine should not be always open to the free expression of opinion. My strictures may be unpalatable to many,—they certainly will be to some of your readers; but as truth must sooner or later triumph, the sooner that delusion which obscures it is dispelled the better. In your review of "Sphinx Vespiformis," what have you said? Every entomologist of my acquaintance was eagerly expecting a decisive opinion from an entomological magazine: your number comes amongst us, and contains no opinion. You merely recommend us to read what we had all read at least a dozen times. Permit me to say, Sir, that in your review there appears a kind of suppressed disapprobation, which, to myself, who am not in your confidence, is quite unintelligible. Did you believe in the theory of a septenary series of circles, you would, with the friendly feeling you manifest towards its author, have openly avowed that belief; but you do not believe; then, Sir, why not boldly say so? You say, the Essay "will be read with pleasure by those who may not be disposed to coincide with the peculiar views of the author:" so it will; but should you not have added, "Such is the plausibility which his extraordinary talent has given to a theory, the most absurd and extravagant

that man ever presumed to palm upon his fellow-creatures." Let me not, however, seek to write down Mr. Newman by the mere force of words, and let him not imagine that I suppose myself capable of doing so; he is an antagonist against whom a giant's arm were ineffectual; and but for the sure and certain knowledge that I am right, and that he is wrong, I dare not thus provoke him to the combat.

I enter not into the subject of the first chapter,—it is as dazzling as I believe it fallacious. I have only to do with the three grand points of the theory, as demonstrated by Mr. Newman, from the class *Insecta;* first, that the class *Insecta* is divisible into seven groups only; second, that *Neuroptera*, the supposed central group, is connected with, or related to, each of the other six, which form a circle round it; third, that of every seven the central one forms a type of the rest.

First. That the number seven prevails in the divisions of the *Insecta* I must unequivocally deny; and I trust I have only to prove the existence of an eighth class,[f] to prove the fallibility of the number seven. For this purpose I select the *Trichoptera*, Kirby,—subclass *Phryganea*, Newman,—and place its characters in contrast with those of the *Neuroptera*, with which Mr. Newman has thought fit to incorporate it.

NEUROPTERA.[g]	TRICHOPTERA.
Mouth perfect, i. e. with perfect mandibles and maxillæ.	Mouth imperfect, i. e. without mandibles or maxillæ.
Wings four, reticulated.	Wings four, clothed with hair.
Prothorax, distinct.	Prothorax, replaced by a collar.
Larva, hexapod, active.	Larva sluggish, in a case.
Pupa, active, voracious.	Pupa, quiescent.

These characters are given in Mr. Newman's own way, and from them it appears that *Neuroptera* and *Trichoptera* have no single character in common. Thus an eighth class is

[f] I observe Mr. Newman terms the *orders* of Linnæus *classes*, thus following Fabricius; and introduces orders as much more limited groups. This is so clearly an improvement, that all scientific men will at once adopt it. The next division, *subclass*, Newm. is *Stirps*. MacL. and must yield to priority.

[g] We are little disposed to criticise the performances of our contributors; but an obvious misstatement must not be passed over in silence. These characters are those of the genus *Libellula* Lin., not those of the order Neuroptera. If this error arise from ignorance, Clericus ought to study before pronouncing so authoritative an opinion; if intentional and for the sake of argument, we pity him: in either case, he is wise in so positively declining a controversy.—Ed.

introduced, and the uniformity of the figure, as well as the imaginary value of the number, destroyed. *Homoptera*, *Dermaptera*, and *Strepsiptera*, seem also to claim an equal rank.

Second. That the class *Neuroptera* is related to each of the other six classes. Let us try this also. In order to make good his position, Mr. Newman places *Psyche*, a genus of moths, with his subclass, *Phryganea*, in *Neuroptera*, and thus connects *Lepidoptera* and *Neuroptera!* He next fancies a relationship between the *Ephemeræ* and the gnats, because "they dance together in the sunshine!" This is as profound reasoning as that by which "the erroneous Rennie" proves antennæ to be ears,—a piece of besotted ignorance which you have very laudably exposed. This is the mode of connecting *Neuroptera* and *Diptera!* The white ants in *Neuroptera* (being larvæ) are supposed to be related to the common ants in *Hymenoptera* (being perfect insects), because both build houses! No relation between *Coleoptera* and *Neuroptera* is attempted; but the next class, *Orthoptera*, is robbed of a genus, *Mantispa*, which is placed in *Neuroptera* for the sake of *making* a relation between these two. Lastly, *Aphis*, in *Hemiptera*, meets *Psocus*, in *Neuroptera*, and there seems, in this single instance, to be a distinct analogy. To sum up, two of these relations depend on genera being misplaced; two more on accidental similarity in habits; a fifth on analogy; and the sixth is, even by the ingenious author, not attempted.

Third. That the central class, *Neuroptera*, is any way a type of the others, cannot be for a moment upheld. Mr. Newman has not descended to any explanation of this; he must have been well aware that any thing that could have been urged in favour of such a proposition must have been met with instant refutation.

This is a fair view of the *Newmannian theory,—system* I cannot call it: it is lamentable that entomologists shall have regarded it as entitled to serious consideration; it bears its refutation on its very face; and yet the author tells one, with the coolest effrontery, that "no one," but himself, "since the days of Linnæus, has ever thought at all," and speaks as though he were perfectly confident that "that great *arcanum*, the *systema naturæ*," were at length discovered.

I see Mr. Newman's name so prominent in your Magazine,

and I see his "Essay" handled so tenderly, and treated with so much respect, that I flatter myself these observations will not altogether escape his notice, and I may reasonably expect that I shall draw on myself his angry reply. I wish now most positively to state, that I shall decline a controversy; and to all who may desire to commence one, I merely say, reperuse *this*.

It is scarcely allowable thus to point out the *errors*, without making any allusions to the *merits* of a work: permit me, therefore, to add, that I have never seen any summary of the characters of the different classes of insects given in so clear, concise, and unexceptionable a manner, as in Mr. Newman's table; neither did I ever read a work on natural history containing such profound ideas, and displaying such varied and great talent, as the one, the main theory of which it has been my endeavour to point out as being completely imaginary. How often is this the case! how often does talent, like the "ignis fatuus," dazzle to mislead.

I am, Sir,

Your subscriber, and generally your admirer,

CLERICUS.

October 1, 1832.

See plate opposite p. 217

ART. XXV.—*Observations on the Circulation of the Blood in Insects.* By JAMES BOWERBANK, ESQ., F. G. & Z. S.

THE larva of the *Ephemera marginata*[a] is the insect which best exhibits the general circulation of the blood, and is the one which has been the principal subject of the following observations. It is figured and described in Dr. Goring and Mr. Pritchard's "Microscopic Illustrations;" but, for my first introduction to the living larva, I am indebted to my friend, Mr. Tulley, with one of whose splendid instruments my observations have been made. These larvæ may be found

[a] It does not appear quite certain of what particular species of ephemera the insect described here is the larva.—ED.

in considerable numbers in small pools of water in boggy or marshy places; mine were procured from similar situations on Hampstead Heath. They may be preserved for many months in glass jars, or other vessels, with a little duck-weed floating upon the surface of the water. In selecting them for the purpose of exhibiting the circulation of the blood, care should be taken to choose such as have not yet attained a greater length of body than about one-eighth of an inch, as the whole insect may then be subjected to examination, with a reasonable expectation of seeing the full extent of the great dorsal vessel; particularly if one be selected which has the intestinal canal free, or nearly free, from food, as the success of the observation will greatly depend upon this circumstance. In fixing the larva for observation, which of course must be in water, great care must be taken not to compress the body, as, although the central circulation may be seen proceeding with considerable vigour, that through the lateral vessels, and those of the tail, legs, and antennæ, will either be much impeded or entirely stopped. Having fixed the insect, with the above precautions, and with its back towards you, a truly beautiful and astonishing sight presents itself. The blood, abounding in flattened oat-shaped particles, will be seen circulating in every part of the body, not in a continuous stream, but at regular periods, agreeing in its motion with the pulsations of the great dorsal vessel. This vessel (Fig. 1, *a*, *a*, *a*, *a*,) extends nearly the whole length of the body, and is of great comparative magnitude. It is furnished, at regular intervals, with double valves, about equal in number to the sections of the body. Both above and below each of these sets of valves is a pair of singular looking appendages, (Fig. 2, *a*.) They are, probably, nervous ganglions, auxiliary to the motions of the vessel, but so exceedingly pellucid as scarcely to be defined with the highest power which can be applied to them. The action of the valves is a most interesting and beautiful sight. While in their greatest state of collapse, the point of the lower valve is seen closely compressed within the upper one, (Fig. 3, *a*.) At the commencement of the expansion of the artery, the blood is seen flowing in from the lateral apertures, (Fig. 2, *b*); and, at the same time, the stream in the artery commences its ascent. When it has nearly attained its greatest state of expansion, the sides of the lower valve are forced

upwards by the increased flow of the blood from the section below the valve, the lateral openings are closed, and the main current of the blood is projected through the two valves, as shewn in Fig. 4, *a*.

It is not easy to see this beautiful structure of the valves of the great dorsal vessel, for it is only when the insect is in a state of great exhaustion, or has been just so much compressed as to destroy voluntary motion without entirely depriving it of life, that it is possible to subject it to a power sufficiently high to discern these extremely delicate and transparent tissues; and even then, to see them to the greatest advantage, recourse should be had only to such as are in the last three or four sections of the body.

The structure of the upper valve appears to be a reflecting inwards and upwards of the inner coat or coats of the artery; and of the under one, to be a contraction and projection of the like parts of a portion of the artery beneath, so as to come within the grasp of the lower part of the valve above it. The exterior portion of the artery may be seen as an exceedingly fine line, connecting the parts above and below the valves, as represented at *c*, Figs. 2, 3, and 4.

The blood does not appear to be confined within any specific vessels, previously to its entering the lateral openings before-mentioned, as, when they open, the particles are seen converging towards them, as shewn by the curved and straight arrows, Fig. 2.

The whole of the blood received throughout the course of this vessel is conveyed to the extremity of the anterior part of the body, where the vessel makes a curve inwardly, and is lost to view at *b*, Fig. 1. To all appearance, the main current of the blood is now discharged into the cavity of the body, as it is seen pursuing its course downwards, in a wide spreading stream, on each side and beneath the great dorsal vessel. As it descends, portions are again absorbed by the valves of the dorsal vessel, and, at the same time, vessels passing down each side of the body convey another portion of the blood to its lower extremity. These are decidedly vessels, not portions of the great abdominal cavity, their boundaries being clearly definable. They communicate at each junction of the sections of the body with the great abdominal cavity, as a part of the blood they convey is discharged at these points, to supply

the place of that absorbed by the valves of the great dorsal vessel; *c*, Fig. 1, shews the course of these vessels, and *d*, Fig. 1, the points at which they communicate with the abdominal cavity. These vessels terminate at *e*, Fig. 1, by discharging their contents into the lower end of the great dorsal vessel.

The circulation is also strikingly and beautifully exhibited in the tail. Here the ascending and descending vessels, like vein and artery, accompany each other; and, at the same instant that the blood is seen to pass up the one, with the usual pulsatory motion, it descends in the other in a similar manner. This is the more apparent, as the sides of the vessels are well defined, and each perfectly distinct from the other.

Although the blood passes with the same pulsatory motion through these minute vessels as it does in other parts of the body, yet no pulsation of either the ascending or descending vessels themselves can be detected. The motion, therefore, seems to be entirely dependent on the action of the great dorsal vessel, which evidently performs in the insect the same functions that the heart does in vertebrated animals.

Supplying and returning vessels may also be seen in the legs, although they cannot be so clearly defined as in the tail; and in the antennæ they pass up on the one side of the first joint, and, turning round at the extremity, they again descend into the head.

Upon fixing the insect so as to obtain a side-view, the great dorsal vessel presents a very interesting appearance. It is seen continually and regularly oscillating backwards and forwards, upwards and downwards, and at the same time the main current of the blood in the great abdominal cavity winds its way in all directions towards the hinder extremity of the insect. Scarcely any larvæ exhibit the circulation of the blood in so beautiful a manner as the one described, although there are few in which it is not more or less to be seen, as I have been able to detect the great dorsal vessel in almost all I have examined. In one, figured in the work before quoted of Dr. Goring and Mr. Pritchard, and said to be the larvæ of a Culex, no particles are visible in the blood; but the great dorsal vessel, its valves, and their singular appendages, are distinctly and beautifully apparent.

Next to the larvæ of the Ephemera marginata, the larvæ of Agrion affords the best view of the blood and its circulation.

In all the species of these larvæ I have yet examined, I have found it as nearly similar as possible in appearance to that which we observe in the Ephemera, and in some instances it has afforded even more satisfactory results. The head of this larva is much more transparent than that of the larva of the Ephemera; we therefore had a better view of the circulation of the blood in the head of this insect than can possibly be obtained in the other. In this object the blood is seen rushing like a beautiful intermittent fountain towards the mouth, and dividing, right and left, into two jets, a portion of each of which flows within a given boundary past the back of the eye, whilst the remainder winds its way through other channels, deep in the side of the head, and returns again into the body.

The antennæ of this insect also afford another beautiful instance of the circulation being carried forward within well-defined vessels. They are each composed of six joints, up four of which the blood is seen to take its course, and turning round the extremity of the fourth joint, it returns by a distinct vessel into the head.

In the leg, likewise, the circulating fluid and its vessels are clearly and distinctly to be traced, even to the very extremity of the tarsus, where, as in the antennæ, the particles of the blood are seen to descend on the one side of the leg, and, turning the extreme point, to return up the contrary side to the one by which they came down.

I regret much that I have not yet had an opportunity of examining the Ephemera in its perfect state; but in two species of Culex, one of which was first observed and brought to me by my friend, Mr. Tulley, I have seen the great dorsal vessel performing its functions in a manner similar in every respect to its appearance in the larvæ of Ephemera, Agrion, &c. &c.; but, from the body of the fly being more opaque than that of the larvæ, and nearly covered with its striated scales, neither the valves nor the particles of the blood could be detected. On another occasion, after having carefully cleared the wings of Phlogophora meticulosa of their coloured scales, both Mr. Samouelle and myself clearly saw a fluid pass down the side of one of the principal ribs of the wing. We may therefore, I think, fairly conclude, that the circulation is carried forward in the perfect insect as well as in the larva, although, perhaps, not with so much vigour as when young and growing.

In describing what I have seen, I have abstained from using the word vessel, except where the margins were distinctly to be defined, although I am inclined, from what I have seen, to be of opinion, that a much greater portion of the circulation than we can clearly define is carried on within given vessels, as the blood may frequently be seen flowing in curved and other lines, and confined within very narrow limits, but so deeply seated amidst the muscles and intestines as totally to prevent the boundaries of the current from being clearly observed. This is strikingly the case in the side-view of this insect, where currents are seen winding about in many different directions, but, from the intervening muscles and intestines their boundaries are not visible; nor can it be expected under such circumstances, when we consider that the blood is a perfectly colourless and transparent fluid, visible only from its containing a number of particles of a somewhat flattened oat-shape; and that the great dorsal vessel itself is only to be seen distinctly with a very high power, and even then can only be defined with certainty whilst it is in motion.

I cannot omit observing a singular coincidence between the flattened oat-shaped particles of the blood in the insect, and of the circular double concave plates in the human blood, which is, that the particles of the former, like those of the latter, assume a globular form immediately on coming in contact with water.

Art. XXVI. — *Observations on the British Species of Sepsidæ.* By Francis Walker, Esq. F.L.S.

Micropeza was the generic name given by Meigen to *Musca corrigiolata*, of Linnæus; or, *Calobata corrigiolata*, of Fabricius, who has placed in the latter genus some Dipterous insects, having not the slightest affinity to each other; one species being a *Sepsis;* another, a *Tachydromia;* a third, a *Borborus;* their only mutual resemblance consisting in the rapidity of their movements. Latreille, in his *Genera Crust. et Insect.*, has placed *Musca cynipsea*, of Linnæus, and *Tephritis macula*, of Fabricius (both belonging to *Sepsis*,

Fallen), in *Micropeza;* also, *Musca cothurnata* and *petronella*, of Linnæus, to which *Calobata* is now restricted. He has removed *Musca vibrans*, of Linnæus, (placed with *Micropeza* in the *Hist. Nat. des Crust.* &c.) to *Tephritis*, which he places next to the other genus, its natural situation, if *Musca cynipsea* and *vibrans* are taken as their respective types, though the affinities of some species included in the two genera are very remote. He has formed nearly the same arrangement in the *Règne Animal*, but in the *Familles Naturelles* it is more artificial; as *Dictya* and *Dacus* are placed between *Tephritis* and *Micropeza*, constituting with *Platystoma*, his *Carpomyzæ*, which, with his *Dolichoceræ*, and a part of his *Gonocephalæ*, form the *Ortalides* of Fallen, containing, among other genera, *Ortalis* and *Sepsis*, *Musca vibrans*[a], *Tephritis cerasi* and *Syngenesiæ*, &c. being the types of the former;—*Musca cynipsea* and *punctum*, of the latter genus; while *Tephritis cardui, solstitialis, radiata*, &c., and *Micropeza corrigiolata*, remain in the same genera. The last-mentioned species is placed with *Calobata*, by Latreille, in the *Dict. de l'Hist. Nat.*, while *Musca cynipsea* and *punctum* are left under *Micropeza*. R. Desvoidy follows this arrangement, and makes a new genus (*Phantasma*) of *Musca filiformis*, which, with *Calobata, Nerius, Sepsis*, &c. he calls *Thelidomydæ*, the 2d tribe of his 5th gens, *Phytomydæ*. In the new edition of the *Règne Animal*, Latreille places the following genera under *Carpomyzæ*. 1. *Diopsis*, Lat. 2. *Cephalia*, Meig. 3. *Sepsis*, Fall. 4. *Ortalis*, Fall. 5. *Tetanops*, Meig. 6. *Tephritis*, Lat. 7. *Platystoma*, Meig.

Fam. SEPSIDÆ.

Caput medium, subproductum, posticè latum: oculi medii, remoti, rotundi: frons lata: ocelli tres, supra verticem in triangulo dispositi: hypostoma depressum: labrum breve, latum, excavatum: proboscis magna, apice lata, rugosa: palpi elongati, graciles, setosi, aut vix conspicui: antennæ capitebre viores, 4-articulatæ; 1°. brevi, 2°. latiore, 3°. magno, ovato, compresso; 4°. setiformi, nudo aut minimè pubescente, articulis multis conspicuis vel indistinctis, supra 3um. basi inserto: thorax elongato ovatus: prothorax supra inconspicuus: mesothoracis scutum maximum, scutellum parvum, productum: metathoracis scutellum

[a] Kirby has called this insect *Seioptera vibrans.*

benè determinatum aut fere inconspicuum : abdomen subpetiolatum aut sessile, convexum, arcuatum, cylindricum aut depressum, lineare aut elongato-ovatum, *maris* nonnunquam apice cornubus aut ciliis vestitum, 4-annulatum : pedes elongati aut breves, *maris* femoribus et tibiis anticis sæpe subtus dentatis et spinosis, coxis anticis elongatis, *maris* tarsis intermediis nonnunquam dilatatis : alæ angustæ, nervis longitudinalibus subrectis : halteres capitati, ab alis remoti.

The insects of this family and of *Ortalis*, may be frequently seen running on leaves in the sunshine, driving away any of the larger *Muscides* which may chance to alight near them, and continually vibrating their wings; their economy is unknown. Sepsis is nearly allied to *Ortalis*, *Nemopoda* to *Calobata*, and *Themira* to *Piophila*.

Characteres Generum.

Abdomen
- subpetiolatum *Alæ.*
  - maculatæ. *Mas*, Femoribus tibiisque anticis, subtus dentatis et spinosis . . . . . 1. SEPSIS.
  - immaculata *Pedes.*
    - in utroque sexu simplices . . . . . 2. NEMOPODA.
    - *Mas*, Femoribus tibiisque anticis subtus dentatis et spinosis, tarsis intermediis dilatatis. *Fem.* Tarsorum articulo 1°. basi compresso . . . . 3. ENICOPUS.
- sessile
  - Metathoracis scutellum benè determinatum . . . . . 4. THEMIRA.
  - Metathorax supra inconspicuus . 5. SALTELLA.

GENUS I.—SEPSIS. *Fallen.*

Musca . . *Linn. De Geer, Harris, Fabr. Gmel. Schrank, Panzer, Berk. Stew. Turt. Olivier, Coquebert.*
Tephritis . *Fabr.*
Micropeza, *Meigen, Latr. R. Desvoidy.*
Sepsis . . *Fallen, Meig. Wied. Latr. Curtis.*

Corpus setosum : palpi vix conspicui : antennæ seta indistinctè articulata : metathoracis scutellum benè determinatum : abdomen subpetiolatum, convexum, arcuatum, apice subtus incurvum, segmento 1°. elongato, apice supra tumido, reliquis brevioribus, *maris* subclavatum, *fem.* elongato-ovatum : pedes setosi, graciles, elongati; *maris* femora antica subtus dentata et spinosa; tibiæ

subarcuatæ, *maris* subtus dentatæ et spinosæ; tarsi articulo, 1°. elongato, sequentibus longitudine decrescentibus: alæ apice nigro maculatæ.

Sp. 1. Sepsis cynipsea. Mas et fem. *Nigro-viridis, hypostomate nigro, abdomine cupreo purpureoque micante, antennis fuscis, pedibus nigris, alis hyalinis.*

Musca cynipsea . . . *Linn. Syst. Nat. 2.* 997. 113. *Faun. Suec.* 1868. *De Geer. Ins.* 6. 33. 18. 12. *Scop. Ent. Carn.* 947. *Fabr. Ent. Syst.* 4. 351. 160. *Sp. Ins.* 2. 451. 82. *Mant. Ins.* 2. 351. 100. *Schrank Fauna Boica,* III. 2461. *Ins. Austr.* 956. *Gmel. Syst. Nat.* V. 2855. *Stew.* 262. *Turt.* III. 618. *Encycl. Method.* No. 128.
The lesser Musca vibrans, *Harris Ex.* 122. Pl. 35. fig. 43.
Tephritis cynipsea . . *Fabr. Syst. Antl.* 324. 41.
Micropeza cynipsea . . *Latr. Gen. Crust.* IV. 355. *Règne Anim.* III. 646.
Sepsis cynipsea. . . . *Fallen Ortal.* 23. 5. *Meigen Dipt. Europ.* V. 287. *Latr. Règne Anim. Nouv. Edit.* V. 532.
Micropeza fulgida . . . *R. Desvoidy, Essai sur les Myodaires,* 742. 3.

Caput nigrum, posticè nigro-æneum: oculi rufo-fusci: antennæ fuscæ, seta nigra: thorax glaber; latera æneo-micantia: abdomen pubescens, sparsè setosum, nitidum, æneo-cupreum, segmentis purpureo cingulatis: pedes pubescentes; coxæ fuscæ, anticæ rufæ; femora nigro-viridia, apice basique fusca, *maris* antica subtus versus medium dentata et spinosa; tibiæ intermediæ apice fuscæ, anticæ fuscæ apice rufæ, *maris* subtus bidentatæ; tarsi nigri aut nigro-fusci, subtus pallidè pubescentes: alæ hyalinæ, basi fuscæ: halteres flavi. (Alarum longitudo, $1\frac{3}{4}$—$2\frac{1}{4}$ lin.; corporis, 1—$1\frac{1}{2}$ lin.)
Var. β.—*Mas,* metathoracis scutellum æneum, nitens.
Var. γ.—*Mas,* abdomen cupreo-æneum, unicolor.
Var. δ.—*Mas,* abdomen æneum, segmentis 1°. et 2°. cyaneo-cingulatis: tibiæ anticæ rufæ; tarsi articulo 1°. rufo.

Var. ε.—*Fem.* abdomen cupreum, segmento 1°. apice æneo-viridi, 2^i. disco purpurascente : femora postica basi rufa.

Common near London, in the spring, summer, and autumn, on trees, plants, &c. Its scent has been compared to that of balm.

Sp. 2. Sep. fulgens. *Præcedenti similis, hypostomate rufo.*

Sepsis fulgens. *Hoffmansegg, Meigen. Dipt. Europ.* V. 287.

With the preceding species, in nearly equal abundance.

Sp. 3. Sep. hilaris. *Præcedenti similis, tarsis omnibus rufis.*

Sepsis hilaris. . . . *Meigen. Dipt. Europ.* V. 288.
Micropeza vivida, var.? *R. Desvoidy, Essai sur les Myodaires.* 742. 4.

It has been found near London.

Sp. 4. Sep. flavimana. *Præcedenti similis, pedibus anticis femoribusque* 4 *posticis basi flavis.*

Sepsis flavimana. *Meigen. Dipt. Europ.* V. 288.

July; south of France. It has been found near London.

Note.—The three preceding species are perhaps only varieties of Sep. cynipsea.

Sp. 5. Sep. maculipes. Mas et fem. *Nigro-ænea, hypostomate nigro, abdomine cupreo, antennis fuscis, pedibus nigris, anticis flavis fusco maculatis, alis hyalinis.*

Caput anticè nigrum : oculi rufo-fusci : antennæ fuscæ, seta nigra : thoracis latera metathoracisque scutellum ænea, nitida : abdomen nitidum : pedes antici flavi, femoribus supra fusco maculatis, tarsis nigro-fuscis ; coxæ flavæ ; femora 4 postica nigro-ænea, basi et *fem.* apice flava ; tibiæ 4 posticæ nigro-fuscæ ; tarsi concolores, subtus nigro-pubescentes : alæ hyalinæ, basi fuscæ : halteres flavi. (Alarum longitudo, $1\frac{3}{4}$—2 lin. corporis, 1—$1\frac{1}{4}$ lin.)

Var. β.—*Mas,* pedes postici tibiis tarsisque nigris ; tibiæ anticæ fusco cingulatæ.

Var. γ.—*Fem.* pedes intermedii tibiis apice tarsisque basi flavis ; tibiæ anticæ fuscæ, basi flavæ.

July; near London. September; near Ambleside, Westmoreland.

Sp. 6. Sep. concinna. Fem. *Nigro-viridis, abdomine purpureo-cupreo, antennis fuscis, hypostomate pedibusque nigris, alis hyalinis.*

Caput anticè nigrum: oculi rufo-fusci: antennæ fuscæ, seta nigra: thoracis latera metathoracisque scutellum ænea, nitida: abdomen nitidum: femora nigro-ænea; tibiæ anticæ nigro-fuscæ; tarsi 4 antici basi nigro-fusci: alæ hyalinæ, basi fuscæ: halteres flavi. (Alarum longitudo, 2—2$\frac{1}{4}$ lin.; corporis, 1$\frac{1}{4}$—1$\frac{1}{2}$ lin.)

July; on grass, beneath trees; near London.

Sp. 7. Sep. ruficornis. Mas et fem. *Nigro-ænea, antennis rufis aut fuscis, pedibus nigris, tiibis anticis flavis, alis subhyalinis.*

Sepsis ruficornis. *Meigen, Dipt. Europ.* V. 288.

Caput anticè nigrum: oculi rufo-fusci: antennæ rufæ, seta nigra: thoracis latera mesothoracisque scutellum nitida: abdomen nitidum: coxæ flavæ; femora nigro-ænea, basi flava; tibiæ anticæ flavæ, intermediæ apice fuscæ; tarsi nigro-fusci: alæ subhyalinæ, basi fuscæ: halteres flavi. (Alarum longitudo, 1$\frac{1}{4}$—1$\frac{1}{2}$ lin.; corporis, $\frac{2}{3}$—$\frac{3}{4}$ lin.)

Var. β.—*Mas et Fem.* tibiæ anticæ, coxæ et antennæ fuscæ.

June; on grass beneath trees; near London.

Sp. 8. Sep. nigripes. Mas et fem. *Nigra, abdomine nigro-æneo, antennis rufis aut fuscis, pedibus nigris, alis subfuscis.*

Sepsis nigripes. *Meigen, Dipt. Europ.* V. 289.
Micropeza nitida. *R. Desvoidy, Essai sur les Myodaires.* 743. 5.

Oculi fusci: antennæ rufæ, seta nigra: thoracis latera metathoracisque scutellum nitida: abdomen nigro-æneum, nitidum: coxæ anticæ rufæ: alæ subfuscæ, basi fuscæ: halteres flavi. (Alarum longitudo, 1$\frac{1}{4}$—1$\frac{1}{2}$ lin.; corporis, $\frac{2}{3}$—$\frac{3}{4}$ lin.)

Var. β.—*Mas et Fem.* antennæ et coxæ anticæ fuscæ.

June to September; on grass beneath trees; near London.

Sp. 9. Sep. violacea. Mas et fem. *Nigro-viridis, abdomine purpureo, antennis fuscis, pedibus rufis, alis hyalinis.*

Sepsis violacea. . . . . *Meigen, Dipt. Europ.* V. 289.
Micropeza pygmæa, var.? *R. Desvoidy, Essai sur les Myodaires.* 743. 7.

Caput anticè nigrum: oculi rufo-fusci: antennæ fuscæ, seta nigra: abdomen, thoracis latera metathoracisque scutellum nitida: coxæ anticæ tibiæque posticæ fuscæ; tarsi apice fusci: alæ hyalinæ, basi fuscæ: halteres flavi. (Alarum longitudo, $1\frac{3}{4}$—2 lin.; corporis, 1—$1\frac{1}{4}$ lin.)

July; on grass, beneath trees; near London.

Sp. 10. Sep. punctum. Mas et fem. *Nigro-viridis, abdomine purpureo basi aureo, antennis fuscis, pedibus rufis, alis hyalinis.*

Musca punctum. . *Fabr. Entr. Syst.* IV. 351, 159. *Coqueb. Illustr.* 109. Tab. 24. Fig. 14.

Tephritis punctum. . *Fabr. Syst. Antl.* 324. 40. *Encycl. Method.* Pl. 395. Fig. 27—29. *Schell, Dipt.* Tab. 4. Fig. 2.

Musca stigma. . . *Panzer. Faun. Germ.* LX. 21. *Encycl. Method.* Pl. 394. Fig. 26.

Micropeza punctum. *Latr. Gen. Crust.* &c. IV. 355. *Nouv. Dict. d'Hist. Nat.* XX. 520.

Sepsis punctum. . *Fallén Ortal.* 22. 4. *Meigen, Dipt. Europ.* V. 289. 10.

Micropeza cynipsea. *R. Desvoidy, Essai sur les Myodaires.* 741. 1.

Caput anticè nigrum: hypostoma rufum: oculi rufo-fusci, antennæ fuscæ, seta nigra: thoracis latera et metathoracis scutellum nitida: abdomen cupreo-purpureum, nitidum, basi aureum: femora 4 postica fusco cingulata; tibiæ posticæ fuscæ, intermediæ apice fuscæ; tarsi apice fusci: alæ hyalinæ, basi fuscæ: halteres flavi. (Alarum longitudo, $2\frac{1}{2}$—$2\frac{3}{4}$ lin.; corporis, $1\frac{3}{4}$—2 lin.)

Var. β.—*Mas*, abdominis segmentum 1um. rufo-viride.

Var. γ.—*Mas*, pedes femoribus omnibus et tibiis 4 anticis fusco cingulatis.

Var. δ.—*Fem.* abdomen purpureo cingulatum: pedes tibiis intermediis tarsique posticis fuscis.

July; near London; on trees, plants, &c.

Sp. 11. Sep. ornata. *Nigro-viridis, abdomine æneo, segmento primo chalybeato, antennis fuscis, pedibus rufis, alis hyalinis.*

Sepsis ornata. *Meigen, Dipt. Europ.* V. 290. 11.

It has been found near London.

Genus II.—Nemopoda, *R. Desvoidy.*

Corpus minimè setosum: palpi elongati, graciles, setosi: antennæ seta distinctè triarticulata: metathoracis scutellum benè determinatum: abdomen pubescens, subpetiolatum, convexum, arcuatum, apice subtus incurvum, segmento 1° elongato, apice supra tumido, reliquis brevioribus, *maris* subclavatum, *fem.* elongato-ovatum: pedes graciles, elongati, non setosi, in utroque sexu simplices; tibiæ subarcuatæ; tarsi articulo 1° elongato, sequentibus longitudine decrescentibus: alæ immaculatæ.

Sp. 1. Nem. cylindrica. Mas et fem. *Nigro-æneus thoracis lateribus anticè et posticè rufis, abdomine æneo-cupreo, antennis rufis, pedibus flavo-fuscis, alis hyalinis apice obscuris.*

Musca cylindrica. . . . . *Fabr. Ent. Syst.* IV. 336. 104.
Musca alis vibrantibus immaculatis. *Geoffrey, Ins.* 2. 536. 84.
Calobata cylindrica. . . . . *Fabr. Syst. Antl.* 263. 11.
Sepsis nitidula. . . . . *Fallén Ortal.* 21. 2.
Sepsis cylindrica . . . . . *Meigen, Dipt. Europ.* V. 290. 12.
Nemopoda putris. . . . . *R. Desvoidy, Essai sur les Myodaires.* 744. 1.

Caput nigrum, posticè nigro-æneum: hypostoma rufum: oculi rufo-fusci: oculi rufi: antennæ rufæ, seta nigra basi rufa: thoracis latera metathoracisque scutellum ænea, nitida: abdomen nitidum: pedes flavi; femora 4 postica supra medio fusca; tibiæ posticæ fuscæ, intermediæ supra pallidè fuscæ; tarsi fusci, 4 antici basi flavo-fusci: alæ hyalinæ, basi flavescentes, apice fuscescentes: halteres albi. (Alarum longitudo, $2\frac{1}{2}$—$2\frac{3}{4}$ lin.; corporis $1\frac{3}{4}$—$2\frac{1}{4}$ lin.)

Var. β.—*Mas,* tibiæ intermediæ fuscæ.

May to August; on plants; near London.

Sp. 2. Nem. stercoraria. Mas et fem. *Nigro-viridis, thoracis lateribus anticè et posticè rufis aut fuscis, abdomine æneo, antennis rufis, pedibus flavo-fuscis, alis subfuscis.*

Nemopoda stercoraria. *R. Desvoidy, Essai sur les Myodaires.* 745. 3.

Caput nigrum: hypostoma rufum: oculi ocellique rufi: antennæ rufæ, seta nigra basi rufa: thoracis latera nitida, anticè et posticè rufa; metathoracis scutellum nitidum, nigro-æneum: abdomen nitidum, apicis latera chalybea: pedes pallidè fusci: femora basi et femora antica subtus flava: tibiæ anticæ coxæque flavæ: tarsi obscurè fusci: alæ basi flavescentes: halteres albi. (Alarum longitudo, 2 lin.; corporis, $1\frac{1}{2}$ lin.)

Var. β.—*Mas*, thoracis latera anticè et posticè fusca.

June; on plants; near London.

Sp. 3. Nem. nigricornis. Mas et fem. *Nigro-viridis, abdomine purpureo-cupreo, antennis nigro-fuscis, pedibus fusco-flavis, alis hyalinis.*

Sepsis nigricornis. *Meigen, Dipt. Europ.* V. 291. 13.

Caput nigro-æneum, posticè cyaneo-nigrum: oculi rufo-fusci: ocelli rufi: antennæ nigro-fuscæ, seta nigra: thoracis latera et metathoracis scutellum nigro-ænea, nitida: abdomen nitidum, segmento 1°. apice purpureo: pedes flavi; femora 4 postica apice æneo-fusca, antica apice pallidè fusca; tibiæ 4 posticæ fuscæ, apice pallidiores: tarsi fusci, 4 antici basi flavo-fusci: alæ hyalinæ, basi flavescentes: halteres pallidè flavi. (Alarum longitudo, 2 lin.; corporis, $1\frac{1}{2}$ lin.)

Var. β.—*Mas*, abdomen cupreo-æneum; segmentum 2um. purpureo cingulatum: tibiæ anticæ fuscæ.

June; on plants; near London.

Sp. 4. Nem. tarsalis. Mas. *Nigro-viridis, abdomine nigro-cupreo, antennis nigro-fuscis, pedibus fusco-nigris, alis subfuscis.*

Caput nigrum, posticè nigro-viride: hypostoma rufum: oculi rufo-fusci: ocelli rufi: antennæ nigrofuscæ, seta nigra: thoracis latera nitida, anticè rufa: metathoracis scutellum nigro-æneum, nitidum: abdomen nitidum: pedes nigri; coxæ flavæ; femora basi flava, apice supra flavo notata, antica fusca apice basi subtusque flava; tibiæ intermediæ apice fuscæ, anticæ flavo-fuscæ; tarsi fusci: alæ subfuscæ, apice basique fuscæ: halteres flavi. (Alarum longitudo, 2 lin.; corporis, $1\frac{3}{4}$ lin.)

August; near London. September; near Ambleside, in Westmoreland.

Sp. 5. Nem. fumipennis. Fem. *Ater, abdomine nigro-cupreo, antennis nigro-fuscis, pedibus nigris, alis fumosis.*

Oculi ocellique rufo-fusci: antennæ nigro-fuscæ, seta nigra: thoracis latera et metathoracis scutellum nitida: abdominis segmentum 3um. fere nigrum: coxæ flavæ; femora basi flava, apice supra flavo notata; tibiæ 4 anticæ apice supra flavo notatæ; tarsi postici basi flavi: alæ fumosæ, anticè versus apicem obscuriores: halteres flavi. (Alarum longitudo, $1\frac{3}{4}$ lin.; corporis $1\frac{1}{2}$ lin.)

July; on plants; near London.

Genus III.—Enicopus,[b] *Walker.*

Sepsis. *Meigen, Curtis.*

Corpus minimè setosum: metathoracis scutellum benè determinatum: abdomen pubescens, subpetiolatum, convexum, arcuatum; *maris* cylindricum, apice cornubus duobus munitum, incurvum, segmento 1°. elongato; *fem.* elongato-ovatum: pedes graciles, elongati, pubescentes; *maris*, femoribus anticis subtus dentatis et spinosis, tibiis anticis subtus bidentatis, tarsis intermediis dilatatis; *fem.* simplices, tarsorum articulo 1°. basi compresso; tibiæ subarcuatæ; tarsi articulo 1°. elongato, sequentibus longitudine decrescentibus: alæ immaculatæ.

Sp. 1. Enic. annulipes. Mas et fem. *Nigro-æneus, antennis fuscis, pedibus nigris, alis subfuscis* (mas), *aut subhyalinis* (fem.)

Sepsis annulipes. *Meigen, Dipt. Europ.* V. 292. 16. *Curtis, Brit. Ent.* 245.

Mas.—Niger: oculi ocellique rufo-fusci: antennæ basi rufæ, seta nigra: thoracis latera metathoracisque scutellum nigro-ænea, nitida: abdomen nigro-æneum, nitidum, segmentis 1°. et 2°. cupreo-æneis, apice brevè setosum: coxæ flavæ; femora nigro-ænea, basi flava; tibiæ apice supra flavo notatæ, 4 anticæ fuscæ; tarsi intermedii aterrimi, articulis 1°. et 2°. basi albis: alæ subfuscæ: halteres flavi.

Fem.—Nigro-æneus: tarsi intermedii nigri, articulo 1°. flavo: alæ subhyalinæ. (Alarum longitudo, $1\frac{1}{2}$ lin.; corporis $1\frac{1}{4}$ lin.)

Var. β.—*Mas*, abdominis segmenta 1um. et 2um. viridi-ænea, 3um. et 4um. nigro-ænea.

July; on grass beneath oak-trees; near London.

[b] Ἐνικὸς singularis, πούς pes.

Genus IV.—Themira, *R. Desvoidy.*

Musca . . . *Linn. List. Goed. Merian, Frisch. Berk. Scop. Gmel. Fabr. Schrank.*
Sepsis . . . *Fallen, Meigen, Curtis, Haliday.*

Seta minimè pilosa, distinctè triarticulata: metathoracis scutellum benè determinatum: abdomen sessile, depressum; *maris* ferè lineare, apice plerumque setosum, segmento 1°. elongato; *fem.* elongato-ovatum, segmentis subæquis: pedes elongati, graciles, *maris* femoribus tibiisque anticis subtus dentatis et spinosis.

Sp. 1. Them. putris. Mas et fem. *Atra aut nigro-ænea, nitida, abdomine* maris *apice brevè setoso, alis subhyalinis aut subfuscis.*

Musca putris. *Linn. Syst. Nat.* 2. 993. 89.
Var. fimeti . *Faun. Suec.* 1. 1110. 2. 1850.
Musca putris. *List. Goed.* 132. *Goed. Ins.* 1. Tab. 73. *Merian, Europ.* Tab. 43. Fig. 83. *Frisch. Ins.* I. Tab. 7. *Berk. Synop.* 1. 165. *Scop. Ent. Carn.* 904. *Gmel. Syst. Nat.* V. 2849. 89. *Fabr. Sp. Ins.* 2. 445. 51. *Ent. Syst.* IV. 334. 92. *Mant. Ins.* 2. 347. 61. *Syst. Antl.* 323. 34.
Musca fimeti. *Schrank, Fauna Boica,* III. 2471.
Sepsis putris. *Fallen, Ortal.* 21. 1. *Meigen, Dipt. Europ.* V. 292. 15. *Haliday, Ent. Mag.* II. 170.

Oculi ocellique rufo-fusci: antennæ nigræ: abdomen glabrum, *maris* apice brevè setosum: pedes nigri; tarsi subtus fusco pubescentes: alæ subhyalinæ, costa nigra: halteres flavi, basi fusci: *maris* femora antica subtus dentata et spinosa. (Alarum longitudo, $2\frac{3}{4}$—3 lin.; corporis $1\frac{1}{2}$—$1\frac{3}{4}$.)
Var. β.—*Mas et fem.* corpus nigro-æneum: alæ subfuscæ.

July; on grass beneath trees; near London.

Note.—Linnæus and other authors supposed this species to be a variety of his Musca casei.

Sp. 2. Them. pilosa. Mas et fem. *Nigra aut nigro-ænea, nitida, abdomine* maris *apice longè setoso, alis subhyalinis.*

Themira pilosa. *R. Desvoidy, Essai sur les Myodaires,* 746. 1.
Sepsis superba. *Haliday, Ent. Mag.* II. 170.

Mas.—Nigra: oculi ocellique rufo-fusci: antennæ nigræ: abdomen glabrum, apice setis vix brevioribus vestitum: pedes nigri; femora antica subtus basi 4-dentata; tibiæ anticæ subtus dentatæ et spinosæ, supra spina elongata valida armatæ; tarsi subtus fusco pubescentes, anticum articulus 1us. elongatus, 2us. 3°. brevior, alæ subfuscæ: halteres flavi.

Fem.—Nigro-ænea: pedes simplices. (Alarum longitudo, 2 lin.; corporis, 1¼ lin.)

July; on grass beneath trees; near London.

Sp. 3. Them. minor. Mas et fem. *Nigra, nitida, abdomine nigro-æneo, apice in utroque sexu nudo, alis subhyalinis aut subfuscis.*

Sepsis minor. *Haliday, Ent. Mag.* II. 170.

Oculi ocellique rufo-fusci: antennæ nigræ: abdomen glabrum: pedes nigri; *maris*, femora antica subtus spinosa, tibiæ anticæ medio subtus bidentatæ: alæ subhyalinæ: halteres flavi. (Alarum longitudo, 1½—1¾ lin.; corporis, ¾—1 lin.)

Var. β.—*Mas et fem.* alæ subfuscæ.

September; on grass beneath trees; near London.

Sp. 4. Them. Leachi. Mas. *Nigra, nitida, pedibus basi rufis, abdominis apice setoso.*

Sepsis Leachi. *Meigen, Dipt. Europ.* V. 291. 14.

Antennæ nigræ: pedes antici femoribus tibiisque subtus dentatis: alæ subhyalinæ: halteres flavi. (Corporis longitudo, 2 lin.)

It has been found near London.

Genus V.—Saltella, *R. Desvoidy.*

Mesothoracis scutellum usque ad abdomen productum; metathorax supra invisum: abdomen sessile, depressum, *fem.* elongato-ovatum: pedes breves, inermes; femora subclavata; tibiæ rectæ: alæ breves.

Sp. 1. Salt. nigripes. Fem. *Nigra, abdomine nigro-æneo, antennis fuscis, pedibus nigris, alis albis.*

Saltella nigripes. *R. Desvoidy, Essai sur les Myodaires,* 747. 2.

Obscura: oculi rufo-fusci: ocelli rufi: proboscis fusca, apice rufa: antennæ fuscæ, seta nigra: mesothoracis scutellum apice rufum:

abdomen nitidum: coxæ flavæ; femora 4 postica basi flava: alarum nervi pallidè fusci: halteres fusci. (Alarum longitudo, $1\frac{2}{3}$ lin.; corporis, $1\frac{1}{4}$ lin.)

August; on a dry sunny bank; near London.

Art. XXVII.—*Observations on the Enicoceri.*

By G. Wailes, Esq.

The natural history of this recently discovered, obscure, but interesting genus of *Coleoptera*, appears to be little understood; probably owing either to the few habitats at present known to entomologists, or to its being confined to the northern parts of the island. If the following observations should throw a little additional light on the subject, and induce others to pursue the inquiry with more minuteness, I trust they will not be altogether useless.

For some years past I had observed the large fragments of the coarse sandstones of the carboniferous series, which were laying half exposed in the river Wansbeck, at Meldon Park, to be covered with innumerable oval cells, measuring about two lines in the longest diameter. From the aperture in each of them, they were evidently the pupæ cases of some small beetle; but as I did not then pay much attention to minute insects, I considered they were probably those of some of the smaller *Helophori*, and, being in pursuit of larger game, undeserving my particular notice. It was not till the summer of 1831 (in the spring of which year I had met with five species of *Elmis* in a brook near Meldon), when on an accustomed annual visit to our watering-place, Tynemouth, I first discovered the *Enicoceri* in this neighbourhood. Examining the stones in a rivulet, within fifty yards of its junction with the sea, in quest of specimens of *Elmis* and *Hydræna*, I observed a beetle, which a moment's inspection assured me was an *Enicocerus*. On commencing a closer search, I found all the three species in considerable abundance, lurking in the inequalities of the coarse stones, just level with, or a little above, the

surface of the water. In this respect these insects differ from the allied genus, *Elmis*, whose favourite resort is the under side of rough stones, apparently preferring such as are in the most rapid parts of the brooks, and that side of the stone exposed to the force of the stream. In the Wansbeck they were in the greatest profusion in August. I have also taken them at various places near Newcastle, in October and April, and doubt not they may be met with most months of the year, though autumn and winter must be considered their principal season. I am borne out in this supposition by the fact of having generally observed the larvæ and pupæ in company with the perfect insect, especially in the autumn. The former (larvæ) are anopluriform, measuring, when full grown, about two and a half lines in length, and half a line in width. They are of an uniform black, and have the apex of each abdominal segment fringed with very short hairs. Their food is most probably mucor, for they seem to be confined to the rough slimy stones; and I find that it is quite as great a waste of time to look for them on a smooth limestone, as to turn up a fragment of basaltic rock (vulg. *whinstone*) in search of *Geodephaga*.[a] When full grown, the larvæ leave the water, and crawl up the sides of the stone in search of a convenient place in which to undergo their change. After a long journey of frequently

a The apparent repugnance of beetles to basalt I have long noticed. Two or three years ago I lost a day or two in June entomologizing in Teesdale,—so far at least as my cabinet was concerned. The subjacent rock of this wild district is almost exclusively composed of the basalt of the great Whin Sill, whose formation is so knotty a point with geologists; and of course the loose stones of the surrounding country are its fragments. Botanists have made its treasures known far and wide; and though I found the exquisite *Gentiana verna*, and the equally rare, though sombre, *Bartsia alpina* in some plenty, I scarce saw a single beetle, notwithstanding I turned over multitudes of *likely-looking* stones, and even they were such as are superlatively common elsewhere, though here "*inter rariores*." So far as my observations, whether confined to single stones or extended over a whole district, go, any place having limestone, particularly the magnesian, for its subjacent stratum, will afford abundance of the *Geodephaga* as well as most other *Coleoptera*, whilst they will be found very thinly scattered over a basaltic region. It is strange to notice the almost uniform absence of these insects on turning up a Whin which has accidentally found its way into a heap of any other stones, though every one of the latter may have one or more tenants under it. Must we not look to the comparative dryness of the limestone and humidity of the Whin for an explanation? We can readily account for the great predominance of the land *Testacea* on a limestone district; but lime does not enter into the composition of beetles.

some ten or a dozen inches, as their fancy or fate may lead them, on finding a projecting angle of rock large enough to ward off any rolling stones, or deep and dreary cavern, formed in the surface by the dropping out of a grain or crystal of the sandstone, capable of affording them shelter, they commence the task of building their pigmy huts. In doing so, they agglutinate small particles of the mud which floods usually deposit on coarse stones; and, when finished, the cases resemble very closely, though on a smaller scale, the nests of the mason-bees, sometimes met with on the rough face of a large stone. So numerous are the pupæ cases of these little beetles, that they frequently almost cover a half-emerged fragment, giving it a curious appearance, and, until one is aware of their nature, looking like projecting parts of the stone itself. The inclosed inhabitant is of a bright orange colour, and after remaining a period of probably only a few days, it assumes the perfect state, and, patiently waiting till its mandibles are strong enough for the task, gnaws itself a passage, and joins its comrades by the water-side. Here a half dozen of them may often be found in one cranny, spending their brief life-time in sipping the nourishment furnished by the stream at their door. Their travels appear very circumscribed, seldom extending beyond a trip to the extreme edge of the moist portion of the stone on which their lot has been cast, or a ramble for an inch or two below the surface of the water. When, however, an accident, or the indulgence of a roving disposition, compels or tempts them to undertake a voyage of discovery, they are soon thrown by the current into the eddy of some oasis of the watery desert, and slowly, but generally surely, reach the shore. Like the neighbouring genera, the *Enicoceri* are often covered by the stream with a deposit of mud, and then require the keen and practised eye of the entomologist to detect them in their lurking-places.

GEORGE WAILES.

Newcastle, November, 1832.

ART. XXVIII. *An Essay on the Classification of the Parasitic Hymenoptera of Britain, which correspond with the Ichneumones minuti of Linnæus.* By A. H. HALIDAY, Esq., M.A.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

SIR,—Among our indigenous insects, few seem to have obtained so little attention from the systematic writers of Britain as the tribes of *Hymenoptera*, corresponding (with a slight modification) to the *Ichneumones minuti* of Linnæus. This branch has not been equally disregarded by the continental authors; but of their methods little more than partial indications have been made accessible to the generality of British collectors. In attempting here to give an outline from those sources, and embodying the results of some of my own investigations, I must hope for the indulgence which the total want of any library of reference will suggest in my favour. During a short stay in London, some years since, the ever-ready liberality of my friend, Mr. Curtis, opened to me the stores of his rich cabinet, as well as various sources of information not otherwise accessible. Some leisure hours have since been passed, not unpleasantly, in recalling and applying the information thus afforded, and from those recollections, and from the materials afforded by my own small collection, I am induced to attempt the sketch of which these sheets form the introductory, and not the least laboured part. The plan I have proposed to myself excludes much pretension to originality. I have, however, in many cases remodelled and amplified the characters of established genera, in accordance with my own observations, and have added some subdivisions that seemed to be pointed out by nature. In addition to the genera previously determined, a few groups have been *indicated* by Mr. Stephens, in his "Systematic Catalogue," and the great mass subsequently by Mr. Curtis, in his "Guide to an Arrangement of British Insects." As the groups proposed by Mr. Stephens were in general unnamed, I had followed the nomenclature of the latter catalogue. A notice in the pages of the "Entomological Magazine" brought to my knowledge an Essay, by Mr. Westwood, on the *Parasitic Hymenoptera*, inserted in the "Philosophical Magazine" (Third Series, No. III.) for

August, 1832. As the genera there *characterized* for the first time appeared to me, with two or three exceptions, to be identical with those I had adopted from Mr. Curtis's Guide, and under his names, to avoid the inconvenience of conflicting nomenclature, it became necessary hastily to review these sheets, and to substitute Mr. Westwood's names in their right of priority.[a] The elegant conciseness and distinctness of his generic characters facilitated this task; and I believe I have succeeded in applying them correctly in general. An abrupt descent from the family to the ultimate generic subdivision, renders it difficult in all cases to combine brevity with certainty (unless by embodying the divisional characters in the generic, an object not easily effected while the divisions themselves are overleaped); accordingly, in one or two instances where no particular indication of affinities was supplied, I had to rest in doubt. The examples given with the tabular view were an after-thought, and added without an opportunity of consulting my cabinet, or any book of reference; but I believe no material errors have crept in.

Yours, &c.

ALEX. HENRY HALIDAY.

Dublin, November, 1832.

[a] There is nothing in science for which we feel a more sovereign contempt, and think more utterly at variance with all proper and gentlemanly feeling, more decidedly indicative of poverty of resource, than the plan here alluded to, of appropriating and superseding the labours of other authors. Had we, instead of Mr. Haliday, been the author thus robbed of our hard-earned property, we hope and trust we should have had the fortitude to have borne the matter as he has done: he has proved himself not merely the gentleman, but the philosopher and christian. We are not, however, a party concerned; and the performance of our duty as Editor of an Entomological Magazine demands from us the undisguised expression of our most decided disapprobation of all such transactions. We noticed Mr. Westwood's paper at p. 85; we received it when our first number was in the press, and were not then aware of its nature.—ED.

Species Ex. gr. delectæ et Synonyma.

Fam. Ichneumones.

** *Subf. Adsciti.* Areola disci externa nulla, antica sæpius completa, *sive* Bracones *et* Bassi. *Nees von Essenbeck.*

* Abdomen sub pectus incurvatile: areola antica disci contigua vel incompleta: palpi maxillares 4-articulati. APHIDIUS.

I. Alæ nullæ: aculeus horizontalis . . . . . Aphidius Ephippium, *Curt. G.*

II. Areola disci antica et cubitales interiores confluentes,

i. et postice definitæ.

1. Aculeus horizontalis *s.* suberectus obtusus . . . . . Aphidius Rosæ.
Ichneumon Aphidum, De *G.*—Schra.

2. Aculeus decurvus cuspidatus . . . . . Aph. constrictus. *Nees.*

ii. et postice effusæ.

1. Aculeus simpliciter falcatus *s.* subconicus. *Monoctonus* . . . . Aph. Caricis, *ined.*

2. Aculeus decurvus inter cornua bina ventralia acuta ipso longiora.
Trioxys . . . . . Aph. Cirsii. *E. B.*

III. Areolæ cubitales 3 et antica disci completæ.

i. Aculeus decurvus tricuspis: antennæ multi-articulatæ. *Trionyx.* . . Aph. deltiger, *ined.*

ii. Aculeus horizontalis: antennæ 11-articulatæ. *Ephedrus.* . . . . . Aph. plagiator.
Bracon plagiator, Nees. *B. M.*

IV. Areola cubitalis unica effusa, antica disci completæ. *Praon.* . . . . . Aph. exoletus, *Nees.*

** Abdomen haud penitus incurvatile.

I. Areola antica disci contigua completa.

i. Palpi maxillares 5-, labiales 3-articulati. ANCYLUS.

1. Aculeus deflexus subulatus . . . . . Ancylus cuspidatus, *ined.*

2. Aculeus falcatus incurvus . . . . . Anc. muricatus, *ined.*

	Species Ex. gr. delectæ et Synonyma.
ii. Palpi maxillares, 6-, labiales 3-articulati.	
1. Areola antica disci antice angulata.	
† Abdominis segmenta 3 magna coalita. SIGALPHUS.	
A. Abdomen breviter ovatum sessile	Sigalphus caudatus. *Nees.*
B. Abdomen oblongum basi angustatum. *EUBAZUS.* .	Sig. macrocephalus.
†† Abdominis segmenta discreta.	*Eubazus macrocephalus*, Nees
A. Areolæ cubitales 3. DIOSPILUS.	Diospilus oleraceus, *ined.*
B. Areolæ cubitales 2. CHARMON.	Charmon cruentatus, *ined.*
2. Areola antica disci antice subtruncata. BLACUS.	
a. Antennæ ♂ articulis pluribus quam 20, ♀ quam 19	Blacus ruficornis.
	Bracon ruficornis, Nees.
b. Antennæ ♂ 19-, ♀ 17-articulatæ	Blacus humilis, *Nees.*
iii. Palpi maxillares 6-, labiales 4-articulati.	
1. Areolæ cubitales 3.	
† Abdomen falcatum aculeo brevi. ZELE.	Zele testaceator, *E. B.*
	Ichn. pallidator, Thunb. *A. P.*?
†† Abdomen oblongum aculeo elongato. MACROCENTRUS. .	Macrocentrus linearis.
	Rogas linearis, Nees, *A. A.*
	Bracon linearis, Nees, *B. M.*
2. Areolæ cubitales 2. ORGILUS.	Orgilus obscurator.
II. Areola antica disci remota vel incompleta.	
i. Palpi maxillares 5-articulati.	
1. Numerus articulorum antennarum determinatus in ♂ et ♀ par.	
A. Antennæ 20-articulatæ. ADELIUS.	Adelius subfasciatus, *ined.*
B. Antennæ 18 articulatæ: alarum posticarum areolæ radicales 2 cubitales 2. MICROGASTER.	
a. Areolæ cubitales 2	Microgaster glomeratus, *Spin.*
	Ichn. glomeratus, L.

Species Ex. gr. delectæ et Synonyma.

b. Areolæ cubitales 3 . . . . . Micr. globatus, *Spin.*
Ichn. globatus, L.

C. Antennæ 14-articulatæ. MIRAX. . . . . Mirax rufilabris, *ined.*

2. Numerus articulorum antennarum incertus, in maribus auctus.

† Areolæ cubitales 3.

‡ Areola radialis angustissima cuneata.

A. Palpi labiales 3-articulati. MICRODUS.

a. Areola disci antica completa . . . . . Microdus gloriatorius, *Nees.*
Bassus gloriatorius, Pz.—*E. B.*

b. Areola disci antica incompleta . . . . . Micr. cingulipes, *Nees.*

B. Palpi labiales 4-articulati, AGATHIS.

a. brevirostres. *DIPLOZON?* . . . . . Agathis calculator.
Microdus calculator, Nees.
Bassus calculator, Pz.—*E. B.*

b. rostrati . . . . . Agathis malvacearum, *Latr.*

‡‡ Areola radialis ovata *s.* oblonga. BRACON.

A. Areola brachialis inferior alarum posticarum brevissima.

a. Antennæ apice compressæ obtusæ. *Genuini.*

a. rostrati . . . . . Bracon desertor, *Spin.*

b. brevirostres . . . . . Bracon nominator, *F.*

b. Antennæ teretes. *Microcephali.*

a. rostrulati . . . . . Bracon delibator, *ined.*

b. erostres . . . . . Bracon minutator, *F.*

B. Areola brachialis infr. alarum posticarum magna.

Sphærocephali . . . . . Bracon denigrator, *F.*

†† Areolæ cubitales 2. LEIOPHRON.

A. Areola radialis apicem alæ attingens. *PYGOSTOLUS.* Leiophron sticticus.
Cryptus sticticus, F.

B. Areola radialis brevissima semilunata.

a. Abdomen sessile . . . . . L. mitis, *ined.*
b. Abdomen petiolatum . . . . . L. apicalis, *Curt. G.*

ii. Palpi maxillares 6-, labiales 3-articulati.

1. Occiput marginatum: mandibulæ forcipatæ: areola disci antica parum remota. PERILITUS.

† Areolæ cubitales 3.

A. Alarum posticarum areolæ radiales 2 . . . . . Perilitus albiditarsus.
Zele albiditarsus, E. B.

B. Alarum posticarum areola radialis 1 . . . . . Per. ictericus, *Nees.*

†† Areolæ cubitales 2.

A. Areola antica disci completa . . . . . Per. rutilus, *Nees.*

B. Areola antica disci et cubitales interior confluentes.

a. Areola radialis ab apice alæ remota semicordata . . Per. secalis.
Ichn. secalis. L.

b. Areola radialis apicem alæ attingens cultrata . . . Per. idalius, *ined.*

2. Occiput immarginatum: mandibulæ hiantes: areola antica disci longe remota. CHOREBUS. . . . . Chorebus affinis.
Alysia affinis, Nees.
Dacnusa uliginosa, Curt. G.

iii. Palpi maxillares 6-, labiales 4-articulati.

1. Occiput immarginatum: abdominis segmenta discreta.

† Corpus elongatum. (Labrum transverso-quadratum). COELINIUS. Cœlinius anceps.
Chænon anceps, E. B.

†† Corpus breve. (Labrum fere trigonum). ALYSIA.

A. Mandibulæ hiantes areolæ cubitales 2. *DACNUSA.*

	Species Ex. gr. Delectæ et Synonyma.
a. Areola radialis ante apicem alæ sinuato clausa . .	Alysia rufipes, *Nees.*
	Dacnusa pubescens, Curt. G.
b. Areola radialis amplissima in apicem effusa . . .	Alysia areolaris, *Nees.*
B. Mandibulæ hiantes tridentes: alæ nullæ	Alysia aptera, *Nees.*
	Chænon apterus, E. B.
C. Mandibulæ hiantes subquadratæ trilobæ *s.* tridentes: areolæ cubitales 3	
a. Stigma conspicuum. Areola disci antica completa.	
a. Antennæ ♀ crassæ pilosæ turbinatæ	Alysia manducator, *Auct.*
b. Antennæ ♂ ♀ graciles.	
α. Stigma definitum breve	Alysia ruficeps, *Nees.*
	Al. pallida, E. B.
β. Stigma attenuato-elongatum	Al. Apii, *E. B.*
b. Stigma conspicuum. Areolæ disci antica et cubitales interior confluentes	Al. cephalotes, *Curt. G.*
c. Stigma nullum.	
a. Areolæ cubitales discretæ	Al. nervosa, *Curt. G.*
b. Areolæ cubitales interiores confluentes . .	Al. concolor, *Nees.*
	Al. pusilla, Curt. G.
D. Mandibulæ hiantes dente intermedio acuminato-elongato: Areolæ cubitales 3. *ALLOEA.*	Alysia contracta, *Curt G.*
E. Mandibulæ forcipatæ: areolæ cubitales 3. *GNAMPTODON.*	Al. rufiventris, *Nees.*
2. Occiput plerumque marginatum: abdomen fornicatum exasperatum segmentis posticis brevibus vel retractis: alarum posticarum nervus recurrens unicus.	
† Abdominis segmenta coalita postica retracta. CHELONUS.	
‡ Areolæ cubitales 2: mandibulæ hiantes 4-dentes. TRACHIONUS.	Chelonus mandibularis.
‡‡ Areolæ cubitales 3.	

	Species Ex. gr. delectæ et Synonyma.
A. Areolæ disci subequales. *SPHAEROPYX* . . .	Chelonus irrorator, *Nees*.
B. Areola disci inferior angusta.	
a. Abdomen triannulatum	Chelonus dentator, *Pz*.
b. Abdomen exannulatum.	
a. Areola disci antica completa	Chelonus rufipes, *Nees*.
	Sigalphus rufipes, Latr.
b. Areola disci antica incompleta . . .	Chelonus sulcatus, *Jur*.
†† Abdominis segmenta discreta. ADEMON.	Ademon decrescens.
3. Occiput marginatum : alarum posticarum nervi recurrentes 2.	
† Abdomen sessile *s*. subsessile,	
‡ et immarginatum,	
⊥ Segmentis 3 anticis magnis subæqualibus,	
A. lanceolatum. ROGAS.	Rogas testaceus, *Nees*.
	Bassus testaceus, F.
	Bracon testaceus, Spin.
B. ovatum aculeo subdeflexo. CLINOCENTRUS. .	Clinocentrus umbratilis, *ined*.
⊥⊥ Segmento 1mo. parvo, 2do. maximo.	
A. Antennæ 11-articulatæ. CHREMYLUS. . . .	Cremylus elaphus, *ined*.
	Hormius ii.—Nees.
B. Antennæ multi-articulatæ, aculeus brevis subdeflexus.	
COLASTES.	Colastes braconius, *ined*.
C. Antennæ multi-articulatæ, aculeus elongatus ascendens.	
RHYSSALUS.	Rhyssalus clavator, *ined*.
‡‡ Abdomen marginatum. HORMIUS.	Hormius moniliatus, *Nees*.
†† Abdomen petiolatum. SPATHIUS.	Spathius clavatus, *Nees*.
	Cryptus clavatus, Pz.
	Cr. mutillarius, F.
	Ichn. attenuator, Thunb.

De Trophis horum Ichneumonum nonnusquam auctoritati obsecutus sum, quales sunt Agathis, Bracon *(sc. Sphærocephali)*, et Sphæropyx a cl[mis]. Latreille, Nees von Essenbeck et Curtis luculenter expressi. Perpaucos etiam (*q. s.* Mirax, Perilitus *sectio ultima*, Trachionus, et Chremylus) in ordinem redegi Analogiæ fere solæ fisus. Reliquorum trophos ipse scrutatus sum.

Desiderantur Genera Helcon, Ichneutes, Cardiochiles, Plancus, Aenone; e quibus Helcon Macrocentris proximus; Aenone sub Alysiis ut subgenus disponendum videtur, Ichneutes forsitan inter Chelonos et Microgastres; Plancus genus dubii situs, Cardiochiles mihi ignotum.

Terminorum interpretatio. Occiput *marginatum* appello cujus limbum ambit undique lineola elevata aut angulata; *immarginatum* quod cum vertice leni tractu confunditur etiamsi a genis atque gulâ sat determinate discretum sit:—areolam anticam disci *contiguam* cujus angulus anticus attingit costam ad basin stigmatis; si aliter fiat *remotam;* — denique nervos *recurrentes* in alis posticis qui ex areolâ brachiali anteriore versus marginem posticum interiorem excurrunt.

II. EXCERPTA QUÆDAM E METHODO CHALCIDUM BRITANNIÆ.

Fam. Chalcides.

* *Pupivoræ*. Nervus subcostalis elongatus, antennæ et pedes mediocres.

† Pentameri.

I. PTEROMALI. Palpi maxillares 4-articulati.

i. Macromeri.

A. CHALCIS, *F. (BRACHYMERIA, Ww.)*
SMIERA, *Spin.*

B. HALTICHELLA, *Spin.*

ii. Isomeri.

1. Isosterni.

A. Carbonarii.

EURYTOMA, *Ill.* DECATOMA, *Spin.* SYSTOLE, *Walk.* ISOSOMA, *Walk.*

B. Metallicores.

a. Dodecatomæ.

a. PERILAMPUS, *Latr.* CRATOMUS, *Dal. &c.*
b. MEGASTIGMUS, *Dal.* TORYMUS, *Dal.*

b. Hendecatomæ.

ORMYRUS, *Ww.*
CYRTOSOMA, *Curt. G.*
SPHEGIGASTER, *Spin.*
PACHYLARTHRUS, *Ww.*
PHAGONIA, *Curt. G.*
GNATHO, *Curt.*
HALTICOPTERA, *Spin.*
PTEROMALUS, *Sued.*
CHEIROPACHYS, *Ww.*
TRIGONODERUS, *Ww.*
CALLITULA, *Spin.*
MACROGLENES, *Ww. &c.*

2. Macrosterni.

a. Dodecatomæ.

CLEONYMUS, *Latr.* STENOCERA, *Curt. G.* EUPELMUS, *Dal.*

b. Hendecatomæ. Antennarum articuli pauciores quam 12 præter annellos sive articulos minutos ad basin flagelli.

CERCHYSIUS, *Ww.*
ENCYRTUS, *Latr.*
ERICYDNUS *(Curt. G.)*. Nervus subcostalis costam longius occupans ante originem ramuli cubitalis.
CRANTOR. Corpus brevissimum contractum apterum thoracis suturis lævigatis.
APHELINUS, *Dal. (CYLLOMUS, Curt. G.)* Nervus subcostalis ultra medium costæ abruptos ramulo cubitali nullo. Antennæ 8-articulatæ.
MICROMA, *Curt. G.*

II. SPALANGIÆ. Palpi maxillares biarticulati.

i. Palpi labiales biarticulati maxillaribus vix duplo breviores. Collare elongatum.

SPALANGIA, *Latr.* alati: caput oblongum fere rostratum.
LAESTHIA, *Curt.* apteri: caput ovatum.

ii. Palpi labiales minutissimi punctiformes. Collare transversum.

PIRENE, *Curt. G.*

†† EULOPHI. Tetrameri: palpi biarticulati subconici.

EULOPHUS, *Geoff*
{DICLADOCERUS, *Ww.*
{*DIOZUS, Curt. G.*
OMPHALE, *Curt. G.*

ENTEDON, *Dal.*
CIRROSPILUS, *Ww.*
{EUPLECTRUS, *Ww.*
{*PERISTUS, Curt. G.*

PTEROMALUS, *Spin.*
ELACHERTUS, *Spin.*
MICROTERUS, *Spin.*
&c.

** *Ovivoræ, s.* MYMARES. Nervus subcostalis brevissimus : antennæ et pedes gracillimi.

I. Pentameri.

OOCTONUS. Antennæ maris 13-articulatæ flagello filiformi, feminæ 11-articulatæ capitulo exannulato.

LITUS. Antennæ maris 13-articulatæ flagello filiformi, feminæ 9-articulatæ capitulo exannulato.

II. Tetrameri.

1. Antennæ feminæ 10-articulatæ capitulo biarticulato.

EUSTOCHUS.

2. Antennæ feminæ 9-articulatæ capitulo exannulato.

A. Abdomen petiolatum.

MYMAR, (*E. B.*) Alæ anticæ capillares apice spathulatæ, posticæ setaceæ.

POLYNEMA. Alæ anticæ obovatæ, posticæ lineares.

B. Abdomen sessile.

ANAPHES. Abdomen ovoideum : antennæ maris 12-articulatæ.

ANAGRUS. Abdomen conico-elongatum : antennæ maris 13-articulatæ.

Familiam hancce integram consultò transilui, generibus a meipso olim vulgatis modo in ordinem revocatis, quippe quæ peritiori in manibus jam versatur optimo angurio.

CONSPECTUS STIRPIUM ET GENERUM OXYURORUM BRITTANNIÆ.

OXYURI. *Latr.* (*PROCTOTRUPINI. Latr. CODRONI. Dalm.*)

I. PLATYGASTRES. Abdomen sessile depressum segm^{to}. 1mo. haud campanulato, ventre marginato : antennæ propre os insertæ fractæ 10—12-articulatæ, radicula sæpe exserta : maxillarum lobus membranaceus integer :

	Species Ex. gr. delectæ et Synonyma.
* Palpi breves frons rotundata.	
† Thorax oblongus, collari amplo bilobo :	
vii. SCELIO. Antennæ feminæ 12-articulatæ : palpi maxillares 3-articulati : areola radialis elongata trigona, nervus subcostalis a costa remotus	Scelio rugosulus, *Latr.*
i. PLATYGASTER. Antennæ 10-articulatæ : palpi maxillares biarticulati : alæ exareolatæ : pedes haud saltatorii :	
1. *INOSTEMMA.* Nervus subcostalis abruptus capitatus : antennarum clava 4-articulata	Platygaster Boscii, *Lat. Curt. B. E.* *Psilus Boscii*, Jur.
2. *PLATYGASTER.* Alæ anticæ aveniæ :	
a. Antennarum clavæ abruptæ 4-articulatæ : scutellum mucronatum.	Platygaster Tipulæ *recentiorum.* *Ichn. Tipulæ*, Linn. *F. S.* ——————Kirb. *L. T.* v.
b. Antennæ apice sensim vel parum crassiores articulo 3^{tio}. minuto vel penitus obliterato	
a. Scutellum mucronatum *s.* fasciculatum	Platygaster ruficornis, *Latr.*
b. Scutellum obtusum	Platygaster elongatus, *Curt. G.*
†† Thorax brevis collari lineari-arcuato : pedes saltatorii.	
‡ Scutellum nullum :	
v. BAEUS. Corpus brevissimum contractum apterum : antennæ feminæ breves clavâ compactâ 5-annulata, ovato-accuminata.— Mas, incognitus	Bæus seminulum, *ined.*
Teleadi affinis etiam generi *Crantori* inter *Encyrtos* haud dissimilis ob "faciem subcoleoptratam." (*Dalm*).	
‡‡ Thoracis segmenta aligera discreta : nervus subcostalis marginem longius occupans et ramulum stigmaticalem emittens, vel alæ nullæ.	

ii. TELENOMUS. Ramulus stigmaticalis in discum alæ oblique descendens: abdominis segmentum primum brevissimum, secundum longe maximum: antennæ feminæ apice sensim clavatæ: palpi maxillares biarticulati: mandibulæ arcuatæ apice denticulatæ (saltem in *T. branchiali.*)

a. Antennæ ♂ 12-articulatæ flagello filiformi: abdomen ovatum . . — Telenomus ater, *ined.*

b. Antennæ ♀ 10-vel 11-articulatæ: abdomen ovatum caput transversum . . . . . — Telenomus brachialis, *Curt. G.*

c. Antennæ ♀ 11-articulatæ: caput subcubicum:

a. Abdomen ob-ovatum . . . . . — Telenomus heteropterus, *Curt. G.*

b. Abdomen conicum elongatum . . . . . — Telonomus othus, *ined.*

iii. GRYON. Antennæ 12-articulatæ maris flagello filiformi crasssiusculo, feminæ clavâ 5-annulatâ: ramulus stigmaticalis brevis: abdomen ovatum segmentis anterioribus æqualibus tertio breviore . . . . . — Gryon misellum. *Telenomus misellus*, Curt. G.

Cum *Teleade* jungendus sub sectionem propriam si trophi satis conveniant id quod adhuc est incompertum.

iv. TELEAS. Antennæ 11-articulatæ maris flagello lineari elongato articulo 5to. angulato; feminæ clavâ quinque-annulata: palpi maxillares 3-articulati: mandibulæ apice emarginatæ. Ramulus stigmaticalis brevissimus: metathorax mucronatus: abdomen obovatum segmentis anterioribus subæqualibus 3^tio^. majore: species plurimæ apteræ . . . . . — Teleas clavicornis, *Latr.*

vi. THORON. Antennæ 12-articulatæ radiculâ elongatâ, maris flagello filiformi, feminæ clavâ 5-annulatâ: palpi maxillares

	Species Ex. gr. delectæ et Synonyma.
4-articulati: labiales subulati 2-articulati: mandibulæ latæ tridentes: ramulus stigmaticalis in discum alæ oblique descendens: abdomen obovatum segmentis anterioribus subæqualibus 3^{tio}. majore. *Corpus æneo-nitens*	Thoron metallicus. *Teleas metallicus*, Curt. G.
** Palpi maxillares prælongi: frons elevata.	
viii. SPARASION. Antennæ 12-articulatæ	Sparasion frontale, *Latr.* *Ceraphron cornutus*, Jur.
II. CERAPHRONTES. Abdomen subsessile immarginatum campanulatum, segmento ultimo ventrali carinato aculeum lanceolatum e rima verticali emittente: antennæ fractæ supra os insertæ: alæ fere exareolatæ: maxillarum lobus membranaceus integer: mandibulæ arcuatæ apice emarginatæ.	
* Antennæ 11-articulatæ, feminæ apice crassiores: abdominis segmentum primum basi constrictum.	
ix. MEGASPILUS. Ocelli 3: oculi magni vel mediocres: stigma crassum, ramulus stigmaticalis arcuatus abruptus: vel alæ nullæ: palpi maxillares 5-articulati	Megaspilus dux, *Westw.* *Ceraphron dux*, Curt. B. E.
x. MICROPS. Ocelli 0: oculi minuti: palpi maxillares 4-articulati: corpus apterum	Microps Rubi. *Ceraphron Rubi*, Curt. B. E.
** Antennæ maris 11-articulatæ: feminæ 10-articulatæ: abdominis segmentum 1^{mum}. maximum basi truncatum.	
xi. CERAPHON. Palpi maxillares 4-articulati: stigma 0: ramulus stigmaticalis arcuatus abruptus, vel alæ 0 . . .	Ceraphron sulcatus, *Jur.*

III. DRYINI. Abdomen convexum immarginatum haud campanulatum: segmento ventrali ultimo carinato aculeum subulatum e rima verticali emittente: antennæ porrectæ 10-articulatæ inter oculos insertæ: alæ areolatæ (secundum typum *Evaniæ*) nervis costalibus discretis: mandibulæ dentatæ. Maxillarum lobus membranaceus integer.

* Os minutum: palpi reflexi breves.

xii. DICONDYLUS. Palpi maxillares 5-articulati: caput latum antice et postice retusum, oculis magnis prominulis: antennæ inferius insertæ: thorax elongatus constrictus apterus: pedes antici remoti coxis longis: tarsis ♀ chelatis:—♂ incognitus . . . . . Dicondylus pedestris, *Curt. G.*
Dryinus (G.) pedestris, Dalm. A. E.
Dryinus formicarius, Dalm. A. H.

xiii. LABEO. Palpi maxillares 3-articulati: caput postice truncatum, facie convexa; thorax brevis compactus: alarum stigma angustum: tarsi omnes maris simplices.—Femina incognita . Labeo vitripennis.
Dryinus vitripennis, Curt. G.

** Os latum: palpi longi penduli, maxillares 6-articulati:

xiv. DRYINUS. Antennæ longiores: tarsi antici feminæ chelati: collare ejusdem sæpius elongatum: alæ distincte areolatæ stigmate trigono . . . . . [Dryinus formicarius, *Latr.*]

xv. APHELOPUS. Antennæ breves: tarsi simplices: collare brevissimum: areolæ disci inconspicuæ: stigma trigonum . . . Aphelopus melaleucus, *Dalm.*
Aph. atratus, Dalm. ♂

IV. PROCTOTRUPES. Abdomen subsessile campanulatum valvulis aculei exertis sub formâ tubi cornei falcati subulati: antennæ porrectæ

	Species Ex. gr, delectæ et Synonyma.
filiformes 12-articulatæ infra frontem insertæ : maxillanem lobus bipartitus : palpi mediocres, maxillares 4-articulati : areolæ disci obliteratæ, nervi costales discreti.	
xvi. PROCTOTRUPES	Proctotrupes brevipennis, *Latr.* *Serphus brachypterus*, Schra. *Ichn. Gravidator*, Linn. F. S.
V. DIAPRIAE. Abdomen petiolatum campanulatum aculei structurâ variante : antennæ fronti insertæ 12—15-articulatæ. Maxillarum lobi connati : palpi maxillares longi 5-articulati.	
* Antennæ porrectæ 15-articulatæ : palpi labiales 3-articulati : alæ areolatæ nervis costalibus discretis.	
xvii. HELORUS	Helorus anomalipes, *Jur.*
** Antennæ fractæ : alarum discus exareolatus.	
† Palpi labiales 3-articulati.	
xviii. CINETUS. Antennæ maris 14-articulati, feminæ 15-articulatæ apice crassiores : areola radialis parva trigona completa : vel alæ 0	Cinetus gracilipes, *Curt B. E.*
†† Palpi labiales 2-articulati.	
A. Antennæ utriusque sexus 13-articulatæ.	
xix. PARAMESIUS. Antennæ prælongæ, maris articulis 2do. et 3^{tio}. minutis : femine apice crassiores articulo ultimo majore : areola radialis angusta elongata parum distincta .	Paramesius rufipes, *Westw.* ♂ *Cerapsilon longicornis*, Curt. G. ♂ ♀
xx. SPILOMICRUS. Antennæ crassiusculæ, maris articulo 2do. minuto reliquis subrequalibus, feminæ ante apicem crassiores articulo ultimo minore quam penultimo : areolæ	

alarum obliteratæ ; punctum minutum retro-cuspidatum stigmatis loco . . . . . Spilomicrus sericeicornis.
Cerapsilon sericeicornis, Curt. G.
Psilus sericeicornis, Spin. L. L. ?

B. Antennæ feminæ 12-articulatæ apice incrassatæ *s.* clavatæ :

xxiii. GALESUS. Caput elongatum compressum fronte valde productâ tuberculatâ : mandibulæ parallelæ descendentes : labrum longius quam latius : antennæ maris 14-articulata : alarum nervi indistincti diffusi. . . . . Galesus cornutus, *Curt. B. E.*
Psilus cornutus, Panz. F. G.

xxii. ANEURRHYNCHUS. Caput haud elongatum : mandibulæ forcipatæ : antennæ maris 14-articulatæ : alæ (ut in Scelione) areolâ radiali elongatâ trigonâ, nervo subcostali a costa remoto . . . . . Aneurrhynchus galesiformis, *West.* ♂
Mythras faunus, Curt. G. ♂ ♀

xxi. PSILUS. Caput parum elongatum : mandibulæ forcipatæ : areolæ alarum obliteratæ ; punctum minutum callosum loco stigmatis, vel alæ 0.

1. Antennæ maris 14-articulatæ . . . . . Psilus elegans, *Jur.*
Diapria verticillata, Latr.

2. Antennæ maris 14-articulatæ feminæ clavâ abruptâ (quadri-) nodi . . Psilus maritimus, *ined.*

Add : Familia hæc obscura nimis, discordiâ auctorum exagitata, nec facile serie continuâ explicanda est. Conspectus allatus mihi ipsi minus placet, et aliis ut vereor inconcinnior reputabitur : E quinque stirpibus adumbratis quarta et quinta intimè cognatæ sunt; secunda et simul tertia a reliquis longius recedunt, forsitan vel hæc vel utraque *Evanias* attingens :—*Antæon* (Latr.) *Dryinos* mares conjugibus dispares innuit ni fallor.—*Belyta* (Latr.) et *Cinetus* (Jur.) idem sonant.—*Belyta* (Jur.) *Cinetorum* nonnullas species antennis feminarum brevioribus perfoliatis et areolâ radiali contractâ insignes vel etiam apteras complecti videtur.—*Platymischus* (Westw.) ambiguum anne *Cinetis* attineat an *Psilis :* feminâ incognitâ interim palpi indicium certissimum

præstare poterunt. — Genera xix—xxiii si melius congrueret forma maxillarum lubenter conjunxissem, generis *Psili* finibus priscis vel restitutis vel auctis.

Bethyllorum genus abnorme inter *Oxyuros* jam diutius exulat, quippe cui locum [et familiæ gradum] inter *Hymenoptera Fossoria* vindicant trophi aculeus (venenatus acris) habitus et mores. Conferendæ Generis *Stigmi* species abdomine subsessili, Ex. Gr. *St. Troglodytes*. Vand. Linden.

AUCTORES LAUDATI.

Curt. B.E. *or* E.B.	Curtis' British Entomology.
Curt. G. . . .	Curtis' Guide to an Arrangement of Br. Insects.
Dalm. A. E. . .	Dalman. Analecta Entomologica.
Dalm. A. H. . .	Kongl. Suenska Vetenskaps Academiens Handlingar, 1820. (*Pteromalini Sueciæ a Dalman.*)
Fall.	Fallen, Specimen Methodi novæ Hymenoptera, &c.—*Laudatum in Ichneumologia Europæa.*
Illig.	Rossi Fauna Etrusca; edente J. C. Illiger.
Kirb.	Kirby in the Transactions of the Linnean Society, IV.—V.
Nees. B. M. . .	Gesselschaft Naturforsch: freunde zu Berlin, Magazin v. d. 1811—1816. (Ichneumones adsciti a Nees von Essenbeck.)
Nees. A. A. . .	Acta Nova Phys-med: Academiæ Cæsar: Leopold. Naturæ Curiosorum. (Conspectus Ichneumonum: linea 2da. ab eodem)—*Laudatum in Ichneumonol. Europ.*

Note. — In a few instances, where it appeared doubtful to which divisions the synonyms in the margin were intended to refer, as we had no means of consulting the author on the subject, we thought it preferable to strike them out altogether, than run the risk of creating any confusion in a paper of such great labour, and such intrinsic value.—Ed.

Art. XXIX. *Abstract of M. Straus-Durckheim's "Considerations Générales sur l'Anatomie Comparée des Animaux Articulés."* By Edward Doubleday, Esq.

(Continued from page 12.*)*

"—— and what is writ is writ—
Would it were worthier! but I am not now
That which I have been—and my visions flit
Less palpably before me—and the glow
Which in my bosom dwelt is fluttering, faint and low."

From the effect of the different modes of gradation of the organs, and from the great modifications which nature has introduced into the different systems of organs, either to accommodate them to the changes which their functions have undergone, or to prepare them for other functions to which they are destined, it results that, at certain points of the scale of classification, the whole of the organization of animals is found completely changed, which marks out in the animal kingdom several large divisions, to which Cuvier has given the name of "*Embranchemens*." The line of demarcation which separates any two of these is necessarily found at the point where the most important organs of one of these divisions have entirely disappeared, or at least have been strongly modified; and where nature introduces successively a new series of organs which are to characterize the other division. It is evident that by the effect of these great changes in the organization of animals, a system of organs which performs the most important functions in the first division, may no longer exist in the next, or, at least, may only be found in a very secondary condition, and subordinate to another system, which has acquired over this a certain degree of preponderance. The knowledge of any organ in one single division is not then sufficient to enable us to judge of its importance; but it is necessary to follow it throughout its whole scale of gradation, and to compare it with all those to which it is found successively in relationship. This principle, so important in classification, has not, perhaps, been sufficiently followed at present, and hence many irregularities in the methods that have been established. In fact, the anatomy of vertebrated animals having been carefully and deeply studied before much attention had been paid

to the organization of the invertebrated, all those organs and functions which are, more or less, invariably sustained in the first division, have been regarded as fundamental; and for this sole reason, the same importance in classification has been attributed to them throughout the whole animal kingdom. From this course of proceeding there naturally has resulted approximations, more or less systematic, which break the natural relationship of many divisions. For example,—in the first great division of animals, respiration and circulation being in fact two functions, to which all the rest are, more or less, subordinate, it has been imagined that we ought to regard them as essential in the whole series of animals, and employ them as the sole basis of classification. Amongst most other animals, on the contrary, these functions being only secondary, this principle has led to fresh errors and contradictions; for it often happens that some one family of *Invertebrata*, which respires by branchiæ, cannot be separated from another family in which the respiration is pulmonary or trachean, without violating relationships depending on most of the other organs. If this truth had been recognized, the *Mollusca* would not have been placed before the articulated animals, which are, in fact, the most perfect of the *Invertebrata*. On the other hand, whatever system we might wish to establish, we could never separate the *Pulmonary* from the *Trachean Arachnida*, or the *Branchiferous* from the *Pulmonary Gasteropod Mollusca*.

It has, moreover, been admitted that animals form a decreasing series from man to the lowest zoophytes; and, as in the first class of *Vertebrata*, which was the best known, the most perfect species is found placed precisely at the head of the scale, the other divisions have also been made to commence with the most perfectly organized species. In consequence of this the larger divisions have been made to appear isolated groups, between which any regular transition seems quite impossible. But the true cause of these sudden transitions is only the too regular degradation which it has been wished to introduce into each division separately, as well as to the principle of the pre-eminence of organs, which has been too much generalized.

Moreover, animals have been mostly classed in a simple series, although a rigorous observation proves that the natural method is ramose, as was first pointed out by Lamarck.

Supposing we had studied with equal care the organization of every animal, and had then placed together the species, genera, and families, which have the greatest affinities, we should easily have recognized their true connexions.

This mode of proceeding would have shown that the series of animals does not form a simple and uniformly decreasing scale, but that each division presents a peculiar mode of organization; that from the point in which the organization is most perfect in each of these great divisions, the animals decrease in perfection of structure towards the other divisions; and that the same occurs in most of the subdivisions.

Hence it results that, in any division, the species which offers the most elevated organization may be more perfect than that which is placed at the confines of an anterior division. An insect is more perfect than a *Lampreda*, though this last is nearer to man.

In arranging animals according to the relationship of all their organs, we find, with M. Lamarck, that certain families conduct, at the same time, to two or three others, which gives the whole scale a ramose disposition.

Leaving the *Annelida* by *Leodice*, we enter the *Myriapoda* by *Polyxenus*, from which class we pass, on one hand, to the *Crustacea* by *Armadillo*—on the other, to the insects by *Lepisma*.

From the *Thysanura* we are conducted to the *Coleoptera* by *Forficula*, thence to the *Brachelytra*, leading to the *Silphæ* and neighbouring genera, which precede the *Carabi*; from these last we proceed to the other *Coleoptera*, which henceforth are not connected with any other division. *Forficula* conducts also to the *Orthoptera*, of which the first genus is *Thrips*,[a] so that this latter order, instead of following the *Coleoptera*, forms a branch placed beside them. From the *Orthoptera* we arrive successively, on the one hand, at the *Neuroptera*, *Hymenoptera*, *Diptera*, and *Aptera* (*Aphaniptera*); on the other, at the *Hemiptera* and *Lepidoptera*; and this last order terminates the third division of the class Insecta.

The isopod *Crustacea*, after having formed a lateral branch,

[a] *Thrips* is mostly placed with the *Hemiptera*; but as it has trophi resembling those of the *Mandibulata*, and particularly long curved mandibles, it must belong to the *Orthoptera*, at the head of which order is its appropriate station.

comprising the *Parasita*, which constitute a separate order, containing *Nymphon*, *Phoxichilus*, *Pycnogonum*, *Cyamus*, *Cecrops*, *Caligus*, *Dichelestion*, *Chondracantha*, and *Lernæa*, are followed by the *Amphipoda*, the *Stomapoda*, the *Decapoda*, and *Limulus*, which genus forms a separate order, under the name *Gnathapoda*, conducting us to the pulmonary *Arachnida*. The *Decapoda* lead, on the one hand, to the *Ostropoda*, and, on the other, to the *Branchiopoda* and *Cirrhopoda*.

The distance is certainly considerable between the *Myriapoda* and the dorsibranchial *Annelida;* but perhaps a few links only are wanting to connect the last to the only family of *Annulosa* with solid external teguments, to which they bear any relation. Probably, if any species be found to fill this void, they will also establish a less abrupt passage from the last *Annelida* to the isopodous *Crustacea*.

The transition from the *Myriapoda* to *Lepisma* is also rather sudden, but their affinity is evident; that from *Lepisma* and *Podura* to *Forficula* is very natural, the *Thysanura* being, as it were, wingless *Coleoptera:* the genera *Ricinus* and *Pediculus* form a lateral branch of the *Thysanura*.

The opinion already noticed, that the *Annulosa* are more nearly connected with the *Vertebrata* than are the *Mollusca*, and consequently form the second great division of the animal kingdom, is true with regard to the modes of organization according to which these three divisions are formed, and also corresponds with the degree in which their faculties are developed. The *Vertebrata* are characterized by an articulated body, of which the two lateral halves are symmetrical, sustained by an internal skeleton, the central portion of which is composed of a series of parts, to which the other parts of the skeleton are attached.

In the *Annulosa*, the symmetry of the two sides of the body is still greater than in the *Vertebrata;* the body is likewise articulated, and formed by a series of central parts, to which the others are attached; but they have no internal skeleton. In both, the nervous system consists principally of a spinal marrow, from which arise most of the nerves of the body; but there is this difference in the *Vertebrata*, the spinal marrow is dorsal; in the *Annulosa*, ventral. The muscular system is as fully developed in the *Annulosa* as in the *Vertebrata;* the muscles offer nearly the same form, and are as perfectly distinct.

The *Mollusca*, on the contrary, exhibit characters totally at variance with those we have just pointed out; on the one hand, their body no longer presents that perfect parity of the two lateral halves, neither is it in the least degree articulated; on the other, the nervous system is not longitudinal, its situation is not so constant, and its mass is less considerable. The muscular system is in general much less perfect than in the *Annulosa*; and, taken in detail, the muscles are less distinct, and only form, in the greater part of the body, a mass of fibres, so interlaced that it is impossible to separate them; thus conducting us to the *Entozoa*, of which the body is only a continuous *parenchyma*, without any distinct muscles.

The character which eminently distinguishes the *Mollusca* from the two other divisions is, that in these the organs of *animal*—in the *Mollusca* those of *vegetable*, life—are the most predominant; whence the latter are totally devoid of that industry, and we may even say intelligence, which insects possess in a degree far superior to all other invertebrated animals.

Lastly, there exists a more natural passage from the *Vertebrata* to the *Annulosa* than to the *Mollusca;* but this connexion is by the lowest in the scale of organization of each of these groups. The *Vertebrata* having reached the most simple form compatible with their mode of organization, nature has commenced from that point a new group, that of the *Annulosa*, by introducing successively a new series of organs, altogether different from those which she has abandoned, and considerably modifying those she has retained. This point is, in the *Vertebrata*, the genus *Ammocœtes*, and perhaps also the genus *Myxine;* and in the *Annulosa*, the genera *Gordius* and *Hirudo*. On both hands these animals are found placed at the lowest point of the descending scale, formed by each of these two series; and, compared with each other, these two genera of fishes and the abranchial *Annelida* offer some remarkable resemblances in the few organs which they possess.

Here let me pause a moment, and consider our author's views of arrangement, more especially as relates to insects. Let any one inspect the following table, and compare it with the septenary system lately proposed by my friend, Mr. Newman.*

* A sketch of the position of Mr. Newman's classes is given by another contributor, at p. 229.—Ed.

M. STRAUS-DURCKHEIM'S *Arrangement of the Orders of Insecta.*

COLEOPTERA.

1st Genus. *Forficula*—— 1st G. | ORTHOPTERA. *Thrips.*

1st G.	NEUROPTERA. *Perla?*	HEMIPTERA.
1st G.	HYMENOPTERA. *Cimbex.*	LEPIDOPTERA.
1st G.	DIPTERA. *Tabanus.*	
1st G.	APTERA. *Pulex.*	

No English naturalist, I believe, doubts that the *Hymenoptera* are connected with the *Coleoptera*, consequently we must remove them a little more to the left, and place them on a level with the *Neuroptera*, with which order their affinity is generally admitted. Few, moreover, will doubt the connexion between *Lepidoptera* and *Diptera*, and that of the former with *Hemiptera;*—and what then? Why, we have the exact order of the diagram, facing p. 21, in "Sphinx Vespiformis." The *Lepidoptera* are undoubtedly allied to the *Neuroptera;* and perhaps it would not be hard to prove an affinity between the *Neuroptera* and *Coleoptera*, and between the former and some Homopterous *Hemiptera*. At least here is enough to make us consider a little before we reject a system which is in harmony with so many natural affinities: for we must bear in mind that that system is nearest to the natural system which exhibits the greatest number of natural affinities, and breaks the fewest.

Our author has placed *Tabanus* at the head of the *Diptera;* but surely this is a desertion of his own principle,—"that it is the less perfect species of any one great group which approaches nearest to the group which precedes or follows it."

Perhaps a connexion may exist between the *Hymenoptera* and *Diptera*, by means of an insect which few would suspect. In my copy of "Sphinx Vespiformis," the author has written on the diagram, between these two orders, "*Pulex?*" Now of this genus M. Straus has said, "*Les puces qu'on peut considérer comme des Diptères sans ailes*," &c., thus allowing an affinity to the *Diptera*, of course by *Hippobosca*. Recent discoveries have, however, proved that the flea has distinct

rudiments, not of *two*, but *four wings;* and every entomologist knows that the *Hymenoptera* have four.

I hope this digression will be pardoned; perhaps I have allowed feelings of esteem for a valued friend to lead me a little out of my way; but let me say, in extenuation, that I feel a deep interest in the theory, having had some little hand in it, as the author has stated in his Preface; but let me also say, that he has much exaggerated his obligations to me. All I had to do with it was this:—previous to its publication, he informed me of the outlines of his system; I, though an enthusiastic admirer of that greatest of living entomologists, W. S. MacLeay, being convinced that truth would be best elicited by full discussion, communicated to him, from my small stock of knowledge, every fact in my possession which might corroborate his theory. Although there is already "something too much of this," I might, perhaps, say a little more in confirmation of my friend's opinions—might venture to add some praise—but I feel that, *now*, *my* praise must be but little worth.

EDWARD DOUBLEDAY.

ART. XXX.—*Entomological Notes.* By EDWARD NEWMAN, ESQ., F.L.S.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

HOWEVER questionable may be the propriety of dividing an old species into several new ones, dependent on characters not generally obvious, I think no one will hesitate in admitting the utility of naming, describing, and recording *newly-discovered* species, or describing and recording those which, though known as exotic, are, for the first time, *discovered to be natives of this country.* Again, where, from the want of a sufficient series, extreme varieties have been named and recorded as species, I consider there will be an evident advantage in re-assembling such false species under one head, and allotting to them the name which may have the claim of

priority. Thirdly, where genera have become unwieldy from the numbers and heterogeneousness of their species, and are necessarily, in description, divided by asterisks, &c., into sections and sub-sections, it seems to me that a service will be rendered to science by furnishing names and characters for such divisions.

Such, then, is the object of the following sheets: their bulk, I am well aware, will preclude the possibility of their publication being completed for a considerable time, which will afford me the opportunity of making any additions which may appear needful.

Should any of our authors hereafter elaborate the subject, by describing a continuous systematic list of species, I hope they will do me the justice to adopt my names, where they are not objectionable, and adopt them as their own; for the mere display of my own name is not the object of these memoranda. Let me add, that should entomologists transmit me newly-discovered species from the country, to be described and inserted in this list, I will adopt any name they may propose, if at all appropriate.

In my descriptions, terms will occasionally be employed which are not at present in general use: these will be fully explained in another paper, sent herewith.[a]

CLASS.—COLEOPTERA.

NATURAL ORDER.—CARABITES, *ined.*

GENUS.—HELOBIA. *Leach.*

Hel. lata. *Nigra; ore, antennis, prothoracis marginibus lateralibus, tibiis tarsisque piceis.*

Black, slightly iridescent, particularly by candle-light: mandibles, palpi, antennæ, tibiæ, and tarsi, pitchy: head black, with an indentation less deep than in *H. brevicollis:* prothorax, very wide the lateral margins alone pitchy: elytra punctato-striated, very wide: shoulders obtusely rounded. Somewhat resembles *H. Æthiops*, Stephens, but is considerably larger and wider. (Length $6\frac{1}{2}$ lin.; breadth 3 lin.)

Taken in abundance in the neighbourhood of Cork, under stones, by Mr. J. B. Bevington.

[a] We have postponed the paper alluded to, in order to admit two others, the authors of which are anxious for their publication. We cannot in any future instances publish contributions in any other order than that of their arrival.—ED.

Hel. varicornis. *Picea; antennis basi rufo-piceis, medio nigris, apice brunneis.*

Pitchy black: mandibles, palpi, and first joint of antennæ pitchy red: second, third, and fourth joints, deep glossy black: the remaining joints pilose, and light brown: crown of the head with a smaller, but deeper indentation than the last: prothorax black: all the margins unicolorous: elytra punctato-striated, deep brown black: legs pitchy: the tibiæ and tarsi somewhat lighter: the two last segments of the abdomen beneath red. (Length 5 lin.; breadth 2 lin.)

Taken, in considerable abundance, in the neighbourhood of Nottingham, by Dr. Howitt.

Hel. impressa. *Nigra, micans; elytrorum striis 3 et 5 foveis impressis.*

Black, glossy: mandibles, palpi, antennæ, and legs sometimes slightly rufous, but generally quite black: prothorax exceedingly narrow, and attenuated posteriorly: the elytra are striated, much depressed, and indented with irregular foveæ on the third and fifth striæ from the suture. (Length $5\frac{1}{4}$ lin.; breadth 2.)

This is a remarkable insect, and not to be confounded with any other; it has been supposed to be the *H. Heegeri* of Dejean, but is distinct. Taken, in considerable abundance, by Mr. Walker, in Scotland.

Of the species of *Helobia* described by the Count Dejean, under the names, *Gyllenhalii*, *Nivalis*, and *Arctica*, together with *H. Marshallana* of Stephens, I have examined 172 specimens within the last month; and though I find the greatest possible difference in size, colour, convexity of elytra, and indentations in the striæ, yet, as intermediate specimens between either extremes are continually to be met with, it seems impossible to determine how or where the line of demarcation is to be drawn. When on Snowdon, last summer, with my friends, Christy and Doubleday, we took all these supposed species within a few yards of each other, and quite a sufficient number of intervening ones to make as many more such species.

GENUS.—LEISTUS. *Frölich.*

Leis. nigricans. *Nigricans, tenuiter iridescens; ore, antennis, tarsisque piceis.*

Dull black, in some lights, with a slightly iridescent tinge: mandibles, palpi, and antennæ pitchy red: prothorax black, considerably more elongate than that of *L. spinibarbis:* elytra likewise narrower: femora and tibiæ black: tarsi pitchy. (Length $4\frac{1}{2}$ lin.; breadth $1\frac{3}{4}$ lin.)

The only specimen I have seen was taken by the late Mr. Hobson, near Manchester, and is now in the collection of Mr. Davis.

Leis. Janus. *Rufescens; prothorace capiteque cæruleo-nigris; ore, antennis, pedibusque ferrugineis.*

Mandibles, palpi, antennæ, and legs, ferruginous: head blue-black: prothorax blue-black, with a slender rufescent margin: elytra rufescent, with an iridescent tinge. (Length $4\frac{1}{4}$ lin.; breadth $1\frac{3}{4}$ lin.)

This beautiful and very distinct species is abundant in the north of England. Its head and thorax resemble those of *L. montanus* (Stephens), while it has the elytra of *L. spinilabris;* its prothorax is rather broader than in *L. montanus,* and its greatest width is precisely central.

Leis. indentatus. *Purpureo-niger; ore, antennis, pedibusque ferrugineis; elytris prope basin striga communi transversa indentatis.*

Mandibles, palpi, antennæ, and legs, ferruginous: head, prothorax, and elytra, glossy purple-black: elytra with a deep transverse indentation, common to both, near their insertion. (Length $3\frac{1}{2}$ lin.; breadth $1\frac{1}{4}$ lin.)

This beautiful little species was taken near Cromer, in Norfolk, by L. Rudd, Esq.

GENUS.—CALATHUS. *Bonelli.*

Cal. apicalis. *Ferrugineus; capite antennarumque apicibus nigris.*

Palpi, the three basal joints of the antennæ, prothorax, elytra, and legs, pale ferruginous: the remaining joints of the antennæ are

deep black, each slightly tipped with ferruginous: elytra striated, without any punctures. (Length 4 lin.; breadth $1\frac{1}{4}$ lin.)

I have only a single specimen of this remarkable insect; it is in Mr. Davis's cabinet, but he does not know its locality.

NATURAL ORDER.———?

GENUS.—LEPTURA. *Linnæus.*

From the examination of a number of living specimens of *Leptura 4-fasciata* and *apicalis*, I have no hesitation in saying, that the latter is merely a variety of the former; I have found them with five, four, three, two, one, and sometimes only half a joint of the antennæ of the pale colour which characterises the species: these varieties occur equally in both sexes, and copulation takes place as commonly between individuals of opposite varieties as between two having antennæ of the same colour. Between *Toxotus meridianus* and *chrysogaster*, I have likewise found every possible variety; in these instances the specific character differs only in the redness of the abdominal segments. In Herefordshire, where these insects are exceedingly abundant, so great is the variety, that I have never detected a copulation between two individuals that were similar in this respect. The names *apicalis* and *chrysogaster* should therefore be discontinued.

CLASS.—HEMIPTERA.

NATURAL ORDER.—CIMICITES, *ined.*

GENUS.—ACANTHOSOMA. *Curtis.*

Acan. picta. *Flavo-viridis; proalis fascia recurva coccinea ornatis.*

Antennæ green, more or less tinged with red: head yellow green: prothorax of the same colour, with its posterior margin at each angle tinged with red: scutellum of mesothorax green: upper abdominal segments sooty black, with green margins: ultimate and penultimate entirely green: interior half of the costal margin of fore-wings yellow-green, below which is a broad, bright, red band, superiorly concave, inferiorly convex: exterior portion of the wing hyaline, with a black transverse fascia and spot: hind wings, towards the abdomen, clouded with black, towards their apex hyaline: legs green, occasionally tinged with red. (Length $4\frac{3}{4}$; breadth $9\frac{1}{2}$ lin.)

This is by far the the most beautiful British species of the order, and is one of the most common; it may be said to swarm on the juniper-bushes in Birchwood, and many other situations in the south of England; yet so much neglected has this order of insects been, that I cannot find that it has been named or described, or was even known before I took it by hundreds in Birchwood, in March, 1830.—*(To be continued.)*

ART. XXXI.—*Observations on the Saltatorial Powers of Insects, and upon the British Coleopterous Genus, Choragus.* By J. O. WESTWOOD, ESQ. F.L.S. &c.

AMONGST the various means which have been bestowed by an allwise Creator upon the little animals which are the peculiar objects of our attention, for the purpose of aiding them either in escaping from the numberless enemies to which they are exposed, or of facilitating their means of obtaining food, the power which many of them possess of affecting an instantaneous change of place, is one of the most interesting; enabling them to leap to a distance, which, in proportion to their individual size, cannot but appear of extraordinary extent, when we consider that it is often several hundred times longer than the whole length of the insect's body; thus almost vieing with the movements of that renowned friend of our childhood —he of the seven-league boots.

This motion is effected in different insects in different manners. Thus the well-known larvæ of the fly which infests cheese and bacon (the *Piophila Casei* of Meigen, &c.—a species which, although far too common, has been the subject of much confusion in systematic nomenclature.—See *Stephen's Cat. Introd.* p. xiii.), performs its astonishing leaps in the same manner (as Messrs. Kirby and Spence well observe), as the salmon, by taking hold of its tail with its mouth, contracting the rings of its body, and then suddenly letting go its tail. A somewhat similar manœuvre is effected by the caterpillars of some moths, as the *Noctua quadra* and *Pyralis rostralis*.

The voracious masked larvæ of the dragon flies are also endowed with the power of suddenly propelling themselves

forward in the water whereby they are able to dart, from a considerable distance upon their prey. The manner in which this motion is effected is very remarkable, and is possessed by no other insects; diving in the water and performing respiration without ascending to the surface for fresh supplies of air, these larvæ are furnished with an apparatus, whereby they are able to extract oxygen from the water in which they reside. This consists of five plates, affixed at the extremity of the abdomen, which are capable of opening and shutting, so as to enclose within the hollow portion of the abdomen, a quantity of water, which, after it has parted with its oxygen, by the action of various internal organs, is forcibly expelled through the same orifice, by which means the insect is suddenly propelled forward.

In the click-beetles *(Elateridæ)* this leap is produced by the sudden jerk given to the body when the insect is laid upon its back, by forcibly striking the acute spine of the breast into the corresponding cavity in front of the mesosternum.

In other insects, as the ground-fleas *(Poduridæ)*, the spring is produced by the sudden unfolding or striking backward of a forked appendage, fixed beneath the extremity of the body.

It is, however, to the peculiar construction of their legs that insects are, for the most part, indebted for their saltatorial powers.

Of these the tormenting flea is the most notable example. Furnished with thighs of great muscular power, and clothed in a tough and highly-polished cuirass, no wonder that it effects an escape in almost every situation, and, to use the words of a favourite French author, "*Comme l'amour rit en sûreté de la blessure qu'elle a faite et de la colère qu'elle occasione.*"

The grasshoppers, locusts, crickets, garden-fleas *(Halticæ*, amongst which the destructive turnip-fly is found), and flea-weevils *(Orchestes)* may be mentioned as examples of leaping powers, originating in the peculiar structure of the hind legs, the thighs being greatly thickened, so as to give support to the powerful muscles wherewith the motion is produced.

This incrassation of the legs does not, however, necessarily imply the power to leap, since many insects, having very thick hind legs, are only able to walk, and that but clumsily, as though the greatly disproportionate size of their limbs were a hindrance to their motion. Thus, although the hind legs of such exotic species as *Bruchus*, *Bactris*, *Leucospis dorsiger*,

Cissites (Horia) testacea, or *Scarabæus (Chrysophora?) macropus* (Francillon) are very much thickened, yet it does not appear that any of them are saltatorial. In like manner our British genera, *Œdemera*, *Nothus*, and *Chalcis*, are not able to leap.

On the other hand, many species which leap well are not provided with thickened legs. Of these the whole of the Linnæan genus *Cicada*, or froghoppers, may be mentioned. So the genera *Eupelmus*, *Encyrtus*, *Cerchysius*, &c. (belonging to the *Chalcididæ*), which have simple hind legs, are able to leap to a very great distance, probably by means of the peculiar formation of their intermediate tibiæ and tarsi. But there are very many species belonging to the same family as the latter genera, the structure of whose legs appears to be in no wise capable of executing a leap, and yet they are able to do this in a very remarkable and inexplicable manner; this is the more extraordinary, since we have seen that the typical genus in the family *Chalcis* is simply a walker, although it has thick hind legs.

The only remaining insect which I shall notice as capable of leaping, although having only simple legs, is the *Choragus Sheppardi* of Kirby, upon the affinities of which I now propose to make a few observations.

This genus was first described in Mr. Kirby's admirable "Century of Insects," published in the "Linnæan Transactions," from specimens taken "*strenue saltans*" at Offton, in Suffolk, by the Rev. R. Sheppard. In Mr. Kirby's description, we find the body described as cylindric, the antennæ clavate, with the two basal joints incrassated, and with a three-jointed club, and the clypeus elongate. Mr. Kirby was not able to discover more than three joints in the tarsi, but Mr. Curtis discovered four in one tarsus. For the reception of this genus Mr. Kirby proposed a distinct family, which he named *Choragidæ*, observing that its general habit connected it with the *Tetramera*, especially *Cis* and *Cryptocephalus*.

Mr. Stephens places this insect in the Pentamerous family, *Plinidæ* (without any observations upon its tarsi), between *Ochina* and *Cis*, stating—"*Choragus* is evidently allied to *Cis*, from which it differs, not only by having the two basal joints of the antennæ incrassated, but by the form of the body, which resembles that of a *Cryptocephalus*, the subsetaceous palpi,

acute mandibles, &c., and by the property the living insect possesses of leaping considerably." Mr. Stephens might indeed have added, that the latter statement was made from personal observation, the loss of the specimen of *Choragus Sheppardi*, which he mentions, being attributable to the insect's power of leaping.

Mr. Curtis places the genus between the *Cleridæ* and the genus *Cis*.

My friend, M. Guerin, has figured an insect in the sixteenth entomological plate of his "Magazin de Zoologie," under the names of *Anthribus pygmæus* of Robert; upon reading the description of which, together with the statement of its leaping powers, it immediately struck me that it was the *Choragus*, and that the affinity thus indicated by the French entomologist, was far more natural than any of those of our English authors. From the figure and description of this insect, the body is cylindric, and the antennæ and clypeus being exactly as in *Choragus*, the apparently penultimate joint of the tarsi is however represented as bilobed in all the legs; so that it would thence appear that they are formed upon the same type as those of the *Bruchidæ* and *Anthribidæ*, and indeed of all the subtetramerous[a] *Coleoptera*; a variation however seems to exist in the number of joints of the tarsi, which is probably an oversight, owing to the minuteness of the insect.

J. O. Westwood.

The Grove, Hammersmith.
Jan. 23, 1833.

P. S. Since my notes upon this genus were penned, M. Guerin has kindly forwarded me a set of the plates of the *Mag. Zool.*; and upon that of the *Anthribus pygmæus*, is the following pencil note:—"*J'ai reconnu depuis que c'est le Choragus Schepardii de M. Kirby, G.*"

[a] I have employed the term *Subtetramera* to designate the *Tetramera* of Latreille, considering that, although the latter denomination may not, as insisted upon by Mr. MacLeay, be grammatically correct, (in consequence of the insects having in reality five joints in the tarsi), yet the peculiar structure of the feet in this section is sufficiently distinct to warrant their separation as a *natural* group from the other pentamerous beetles.

Art. XXXII.—*Monographia Hydrænarum Angliæ.*

By George R. Waterhouse, Esq.

Gen. 1.—Amphibolus.[a] *Waterhouse.*

Maxillary palpi shorter than the thorax: basal joint long, bent, the two terminal joints short: antennæ, with the two basal joints, very long and slender, the rest forming an elongate club: legs moderate: tarsi four-jointed: head large: eyes prominent: thorax with the sides more or less dilated: elytra convex, elongate, ovate.

This genus forms a beautiful link between the two genera, *Hydræna* and *Ochthebius*, having the usual colouring of the former, suffused with a sub-metallic tint, in which respect it approaches the latter: it also approaches nearer to the genus *Ochthebius*, in having the elytra larger than the abdomen, and in the form of the legs; but the palpi are nearly three times as long as in that genus, though not so long as those of *Hydræna*.

Not having a specimen myself, and Mr. Davis (who kindly lent me the one from which the description was made) having but one specimen, I am unable to dissect, the only means by which I might give a more accurate description of the tarsi and antennæ.

Sp. 1. Amp. atricapillus. *Piceo-testacea, submetallica; capite nigro, magno, posticè punctato; oculis prominentibus; thorace lateribus dilatatis, densè punctato, foveis quatuor impressis: elytris ad basin thorace vix latioribus, elongato-ovatis, convexis, punctato-striatis; abdomine minimo: antennis, pedibus, palpisque pallidè fulvis.* (Long. corp. $\frac{5}{8}$ lin.)

I have seen but one specimen of this interesting species, which was taken at Hebden-bridge by Mr. Gibson.

Gen. 2.—Hydræna. *Kugellan.*

Head large, triangular, truncated in front: thorax subquadrate, with the sides more or less dilated: scutellum minute: elytra more or less ovate, elongate: legs long: tarsi very slender, the terminal joint very long: antennæ minute, 8?-jointed, the

[a] Ἀμφίβολος, *dubius.*

two basal joints long, the rest forming an elongate club: palpi as long as the head and thorax, three-jointed: the basal joint long, bent, and clavate, second moderate, thickened at the apex: terminal joint long, thickened in the middle, attenuated at each end.

Sp. 1. Hyd. riparia. *Atra, nitida; capite thorace angustiore, inter oculos profundè punctato; thorace longo, lateribus dilatatis, densè punctato, sulco longitudinali utrinque ad marginem: elytris piceo-brunneis, lineari-elongatis, apice rotundatis et distinctè punctato-striatis: pedibus, antennis, palpisque piceo-ferrugineis aut piceis.* (Long. corp. $1\frac{1}{8}$—$1\frac{1}{4}$ lin.)

Hyd. riparia. *Kugellan. Schmeid. Mag.* 578.

In this and the three following species, the eyes are but slightly prominent, and the head is rather elongate, with the sides nearly parallel; the body is also very linear.

I have taken several specimens of this species in the river Wandle, Wandsworth. Hebden-bridge; Mr. Gibson.

Sp. 2. Hyd. pulchella. *Præcedentibus (nigrita et gracilis) minor: caput triangulare antice obtusum, nigrum, nitidum, punctulatum: antennis palpisque rufis: thorax latitudine paullò breviore, lateribus rotundatus, posticè paullò magis angustatus, basi apiceque truncatus, supra punctatus, disco subtilius; obsoleto canaliculatus, sulcoque utrinque longitudinali versus latera impresso: color niger, nitidulus margine antico posticoque dilute latiora, oblongo-ovata, convexa, punctato-striata, picea: corpus subtus nigrum, pedibus rufis.*[b]

Hyd. pulchella. *Müll. Germar. Ins. Spe.* Vol. I. p. 94. *Curtis's Brit. Ent.* p. 308.

Not having a specimen of this species, which is introduced in Mr. Curtis's "British Entomology," I have given Germar's description.

Sp. 3. Hyd. concolor. *Pallidè testacea; capite inter oculos punctato: thorace lato, lateribus dilatatis, densè punctato: elytris elongatis, linearibus, manifestè punctato-striatis.* (Long corp. $1\frac{1}{4}$ lin.)

Allied to *H. riparia*, but at once known by its pale colour: the head is rather smaller in proportion, the thorax is broader, and

[b] Is not the word *elytra* omitted? the description does not seem quite intelligible.—Ed.

not so thickly punctured. This species is often confounded with *H. testacea*, but it is much larger, its form is more linear, the head is of a different form, the sides being nearly parallel, and the eyes scarcely prominent: the thorax is much larger and broader in proportion, not so coarsely punctured: the striæ of the elytra are wider apart, and likewise not so coarsely punctured. In some specimens the head is of a pale pitchy-testaceous, but it is generally concolorous with the body, in which respect it also differs from *H. testacea*, which always has a black head.

Taken at Hebden-bridge, by Mr. Gibson and A. H. Davis, Esq.

Sp. 4. Hyd. nigropicea. *Piceo-nigra; capite densè punctato, oculis prominentibus: thorace breviore, densè punctato, foveis quatuor leviter impressis: elytris oblongo-ovatis, sub-truncatis, punctato-striatis, striis sub-confluentibus: antennis, pedibus, palpisque rufo-testaceis.* (Long corp. 1 lin.)

About the size of *H. riparia*: the eyes are more prominent, the thorax is shorter, the elytra are ovate and subtruncate, whereas in *riparia* they are linear, and rounded at the apex.

I have once met with this species near London. Epping; E. Doubleday, Esq. I have also seen several specimens from Hebden-bridge.

Sp. 5. Hyd. melanocephala. *Testacea; capite nigro-piceo, profundè punctato, oculis magnis, prominentibus: thorace brevi, lateribus dilatatis, densè punctatis, foveis quatuor leviter impressis: elytris latioribus, ovatis, vix truncatis, leviter punctato-striatis: antennis, pedibusque pallidè testaceis, palpis testaceis, apicibus nigris.* (Long. corp. 1 lin.)

Allied to the foregoing, but known by its pale colour, it is altogether broader and shorter in proportion: very distinct from *H. testacea*, which it resembles in colour; it is much larger and broader, the thorax is considerably dilated at the sides, and very short; it is also more delicately sculptured throughout. Netley, Salop; Rev. F. W. Hope.

Sp. 6. Hyd. testacea. *Pallidè piceo-testacea: capite nigro, densè punctato, oculis prominentibus: thorace angustiore, lateribus vix dilatatis, profundè punctato, ad*

angulos depresso : elytris elongato-ovatis, ad apicem rotundatis, profundè punctato-striatis : antennis pedibusque pallidè testaceis : palpis pallidè testaceis, apice nigris, gracillimis et elongatis. (Long. corp. $\frac{7}{8}$ lin.)

Hydræna testacea. *Curt. B. E.* p. 307.

This species may readily be distinguished from its pale congeners by the coarse sculpture, and by the form of the thorax, which is scarcely dilated at the sides.

I have taken this species tolerably plentiful in the ditches in Battersea-fields. Epping: E. Doubleday, Esq. Halifax: A. H. Davis, Esq.

Sp. 7. Hyd. nigrita. *Atra; capite densè punctulato, oculis prominentibus: thorace breviore, densè punctato, sulco utrinque longitudinali versus latera impresso: elytris brevibus, ovatis, lævissimè punctato-striatis, striis subconfluentibus: antennis, pedibus palpisque rufo-testaceis.* (Long. corp. $\frac{3}{4}$ lin.)

Hydræna nigrita. *Müller Germ. Ins. Spe.* p. 93.
pusilla. *Stephens.*

The short ovate form and dark colour distinguish this species from all the foregoing.

I have taken three specimens of this species in the neighbourhood of London.

Sp. 8. Hyd. pygmæa. *Piceo-brunnea; capite nigro, fronte punctato, oculis prominentibus; thorace anticè lato, postice attenuato, foveis quatuor impressis, duobusque leviter impressis discoidalibus, punctato; elytris brevibus, ovatis, densè punctatis: pedibus robustioribus, piceo-ferrugineis, palpis brevioribus et robustioribus, rufo-ferrugineis.* (Long. corp. $\frac{5}{8}$ lin.)

Distinguished from all the foregoing by the want of regular striæ on the elytra: about the size of *H. pusilla:* the thorax is longer and broader in front, less deeply punctured, but the foveæ are more deeply impressed: elytra shorter and not so ample; legs and palpi thicker.

The only specimens I have seen of this curious little species, were taken at Hebden-bridge by Mr. Gibson.

Sp. 9. Hyd. minutissima. *Piceo-brunnea: capite nigro, lato, posticè densè, anticè vix punctato; oculis prominulis: thorace lateribus rotundatis, anticè latissimo, densè punctato, ad angulos depresso: elytris elongatis, obtusè ad apicem rotundatis, distinctè punctato-striatis: pedibus, antennis palpisque rufo-testaceis.* (Long. corp. $\frac{5}{8}$ lin.)

Hydræna minutissima. *Stephens.*

This species may be known from all the foregoing by its minute size and the proportionately large head and thorax.

I have taken one specimen of this species in the neighbourhood of London, but forget the exact locality. Newcastle-upon-Tyne; C. Hewitson, Esq.

Sp. 10. Hyd. gracilis. *Nigra, nitida: capite inter oculos punctato: thorace longiore, lateribus dilatatis, punctato, sulcis duobus longitudinalibus impresso: elytris nigro-piceis aut nigris, angustatis, punctato-striatis, suturâ paullò elevatâ; antennis, palpisque rufo-piceis: pedibus nigris, geniculis tarsisque rufis.* (Long. corp. $1\frac{1}{4}$. lin.)

Hydræna gracilis. *Müller. Germar. Ins. Spe.* p. 94.
elongata. *Curtis.*

Closely allied to *H. riparia*, but may be distinguished by its more elongate narrow form, and black legs; the eyes are also rather more prominent.

I have one specimen of this insect, but do not recollect its locality.

Art. XXXIII.—*On the Existence of "Natural Genera."*

By Alexander William Griesbach, Esq. B.A. *of Trinity College, Cambridge.*

> "Ne mea dona, tibi studio disposta fideli,
> Intellecta prius quam sint, contemta relinquas."

Of all the qualities of the human mind, there is none more enviable, and none which has been the cause of greater good to mankind generally, than an acute perception of the beauty

of nature. It is this perception which has alike inspired the philosopher, the painter, and the poet; and it would be difficult to point out an art or a science which has not been, directly or indirectly, benefited by it.

But how useful soever the results of this keen relish for nature and natural things may be, the study of them is no less amiable for its own sake; and perhaps no purer happiness can be enjoyed on earth than that which arises from it. If it be true that "a main article of human happiness is the exercise of our faculties, either of body or mind, in the pursuit of some engaging end,"—surely no end can be proposed more engaging than the perusal of the great book of the creation, whose every page is full of interest and beauty.

There are but few, however, whose avocations will allow to take more than a cursory view of the general scheme of nature; and we usually find that naturalists have chosen some particular branch, upon which to bestow the greater portion of their labours and investigation. And here, as a lover of entomology, I cannot refrain from expressing the pleasure with which I have observed the increasing attention paid to this wonderful and delightful study.

Entomology is indeed a study which will well repay those who may bestow their attention upon it; yet, whether from the comparative difficulty of pursuing it, or in consequence of the sneers of the vulgar-minded, it has never been, and probably never will be, extremely popular. Those, however, who are the best acquainted with it, consider it as, perhaps, the most wonderful branch of the creation, and as affording some most valuable auxiliary evidences of the existence of a Supreme Being; and whilst those individuals of the animal kingdom, which are most remarkable for their gigantic bulk, more particularly excite the attention of the many, the entomologist sees in those atom-like beings, which others pass by absolutely without notice, organs as perfect, and as beautifully adapted to their particular functions, as any which are to be found in the whale or the elephant.

Interesting, therefore, as even a vague acquaintance with entomology is, we shall be still more interested when we observe how beautifully and gradually its almost endless varieties of forms are blended, and flow into each other. Indeed so nicely, and almost imperceptibly, does this blending

take place, as to have led to the supposition that nature knows no division of *kinds* or "*genera*," but that *specific* distinction is all that can be proved to exist.

Now as this supposition is what I have proposed as the subject of inquiry in the present paper, it may be as well, before entering upon the inquiry, to give a definition of a "genus;" and in so doing, I must observe that, supposing the existence of generic groups in nature, the characters by which we separate such groups must necessarily be, in some measure, *arbitrary*, since we cannot know *of a certainty* where one group terminates, and another begins. I define a "genus" to be—

A group of specifically distinct individuals, similar to each other, more or less, in habits and economy, which have at least one character in common, and this a character either not found in other groups, or not found in other groups with a like combination of characters.

The aphorism, "*Natura non facit saltus*," is generally acknowledged to be true, and of its truth I am fully convinced; for so gradual is the transition from one form to another, not only in entomology, but in every form of matter throughout nature, at least where we have most knowledge, that it is but reasonable to suppose, when we observe any insulated form, it is only so insulated because the links which would make it harmonize with the whole are unknown to us. But admitting this, I contend that groups do exist in nature, of which the individuals of each respectively agree, more or less, in general characters, one with another, but do not so agree with the individuals of any other group.

As it is to be supposed that "genera" exist *throughout* nature, if at all, it signifies but little from which part of nature we reason. Let us, therefore, for the sake of illustration, take the horse, the zebra, and the ass, and place them in a group together. The first thing that strikes us is, that they have a great general resemblance to each other: the outline of their respective forms is much the same; their various members are similar, their habits are nearly alike: in these points the three individuals agree one with another. But, following up the comparison, we find that, although a *general* resemblance obtains between them, they differ from each other in certain *particulars*, which, as the position is all we want, may be

taken for granted. Let us now take the lion, the tiger, and the leopard, and examine them in the same manner. We arrive at the same conclusion. They have a general resemblance to each other, but differ "*inter se*" in particulars. Now the resemblance they bear to each other constitutes the *genus*, the difference between them the *species*.

A comparison of these two groups, one with the other, will show that hardly a single character is there in common between them. The individuals of the first feed upon grass and herbs; those of the second upon the flesh of other animals: according to their different habits their organs are formed; and surely no two groups can be more dissimilar. All that they resemble each other in is, that the individuals of both are viviparous, and suckle their young, characters hitherto thought no more than sufficient to class them equally as "mammalia." This difference of groups exists as strongly in insects; and it is a difference, I think, as clearly pointed out by nature as the difference of one species from another.

The principal argument of the unbelievers in genera is, "that although it may be extremely easy to form two groups apparently unlike each other in every respect, yet a series of insects may be formed which shall so gradually connect any two such groups, that it shall be impossible to say where the one terminates and the other begins;" hence they deduce that genera do not exist.

Now if this reasoning is good for any thing, it ought to be of universal application; but will it lead us to doubt that animals and vegetables are separated from each other by nature, because the line of separation is not clearly discernible? for so great is the difficulty naturalists have experienced in drawing this line, that the only characters of distinction hitherto given, are not wholly free from objection. Will it lead us to conclude that *matter* is either all organic, or all inorganic, because "the line of demarcation between the mineral kingdom and organized matter is allowed to be indistinct?"

But if the gradual merging of one genus, so called, into another, be sufficient to show that genera exist not in nature, it will follow that neither do "orders" exist; for it cannot be doubted that insects exist which will link every order together.

I have seen an Algerine insect, in Mr. Waterhouse's possession, which closely connects the Orthoptera and Hemiptera, resembling both the *Blattidæ* and *Cimicidæ:* and in the cabinet of Mr. Stephens is another insect, which partakes of the characters of the Coleoptera and Strepsiptera. Granting therefore all insects to be linked together in most easy gradation, which in fact they are, would it be the language of nature to say, "This butterfly is a distinct species of beetle;" and *vice versâ?* It may be answered, "No;" but it would be correct to say, "This butterfly and this beetle are distinct species of insects." But it unluckily happens, that if such stress be laid upon "*links*," even "*insects*" can no longer be considered a distinct group; the transition from them to the Arachnoïda, &c. being easy, and equally so from one group to another, throughout animated nature. And what is worse, the difficulty does not end here—for animal and vegetable nature are as closely linked to each other as animals are; so that, by way of being correct, we must speak of every palpable being, merely as a form of matter, unless indeed we follow Bishop Berkeley in his theory, that *matter does not exist.*

But to return to the objection. It is said that in entomology, "so gradual a connecting series may be formed from one group to another, that it shall be *impossible* to draw the line between them." This *impossibility*, however, I am disposed to deny; and in the definition I have indicated that, if no where else, this line can be drawn where individuals, in such a series, cease to have a single character in common with those which precede them.

Mr. Newman is of opinion, "that a genus should be established for every species whose primary characters differ from those of its congeners," and probably these would be true natural genera; for if the transitions from the great groups to each other be so gradual, we may suppose those from the smaller groups to each other to be still less abrupt, and the genera indicated by these types may contain many species with which we are at present unacquainted.

But it was not my purpose here, to show how genera may be *distinguished*, but if possible to prove their *existence*, which I trust I have in some measure accomplished. If what I have written should prove the means of exciting enquiry and discussion, by which not only the existence of genera

shall be ascertained, but a clue to their formation discovered, I shall be satisfied to have written not uselessly, if not well.

Art. XXXIV.—*Notice of Entomological Works.*

1. *British Entomology, by J. Curtis, F.L.S.*, Nos. 105—110. —No. 105 contains, 1. *Oxyporus maxillosus.* This is a beautiful figure; the species from which it is drawn is very rare as British, existing only in the cabinets of the British Museum and Mr. Kirby; its congener *rufus* is comparatively common, being taken at Birchwood and other localities near London, in an *agaricus*, which grows on the stumps of fir-trees which have been felled. 2. *Nomada Dalii*, with a list of thirty-seven British species: the economy of this tribe of bees is at present unknown, although some of the species are among our commonest insects. 3. *Cerostoma annulatella.* This elegant little moth is remarkable for holding its antennæ, when at rest, porrected in a right line from its head, and touching each other, in the manner of *Phryganeæ.* 4. *Hippobosca equina.* This insect is much too highly coloured; we have often possessed them when alive and active; they are nearly unicolorous. The *Hippoboscæ* are pupiparous, and, with the *Notostomata* of Dr. Leach, probably form an osculant group, which connect the Diptera in *Insecta* with some of the parasitical *Acaridea.* The tenacity of life in these horse-flies is truly remarkable; we have deprived them of their heads, and allowed them to run again on our horse, which they do backwards, forwards, and sideways, with precisely the same apparent ease as before: although they do not bite, the irritation they occasion appears to be intense, and renders horses that are unaccustomed to them perfectly unmanageable.—No. 106 contains, 1. *Arcopagus puncticollis.* This curious little insect had been previously very correctly figured by Mr. Denny, in his excellent monograph on the *Pselaphidæ*, and we rather regret Mr. Curtis did not wait for a new species before he figured the genus. 2. *Fœnus assectator.* 3. The beautiful and rare moth, *Psodos equestrata.* 4. *Xylota bifasciata*, one of the *Syrphidæ.*

The generic name, *Xylota*, we could have wished restricted to the species *pipiens*, which appears to us typical; and a new name might have been given to the remaining species. The *Xylotæ* have a remarkable analogical resemblance to the *Ichneumones*, running with great activity about the leaves and stems of plants, in the sunshine, with their wings closely folded on their backs.—No. 107 contains, 1. The very common *Cychrus rostratus*, so remarkable for its hissing noise, very much resembling that made by a water-beetle, *Pælobius Hermanni:* this noise has often attracted our attention when we have captured it. The *Cychri* usually conceal themselves at the roots of long grass, or under stones, in the day-time; and in the night, or sometimes in moist showery weather, even in the day, they ascend shrubs, in search of larvæ and perfect insects, on which, like the *Calosomæ*, they feed. 2. *Phagonia smaragdina*. This is a beautiful and interesting little Hymenopterous parasite. The genus appears identical with *Pachylarthrus* (Westw.) characterized in the Philosophical Magazine for August, 1832; and, much as we deprecate the publication of the characters of disconnected genera, for the paltry fame of attaching a name to them, it is our duty, and it ever shall be our endeavour, to give precedence to priority, however obtained, as it seems our only sound mode of deciding nomenclature: one species, that named *Insignis* by Mr. Westwood, seems to have been described by Dalman in the Stockholm Transactions, under the name *Diplolepis patellana*. Mr. Curtis has made a mistake in referring this little insect to the family *Cynipidæ*, to which it has no affinity. 3. *Nola monachalis*, a pretty little moth, and elegantly figured. Mr. Curtis wishes to make this genus something like a stepping-stone from the *Pyralides* to the *Torticides;* we do not see the weight of his arguments on this subject. 4. *Helophilus Ruddii*. This is a beautiful and interesting plate: the fly was taken by L. Rudd, Esq. near Yarmouth, in Norfolk: it has the head and antennæ of a *Criorhina*, and the abdomen of a *Tabanus;* the thorax is longitudinally striped, like that of *Helophilus*, to which genus, however, it does not appear to us to be at all nearly related.—No. 108 contains, 1. *Hypoplæus bicolor*. 2. *Trachea atriplicis*, with a larva copied from Hubner, in which we fear there is some mistake, as Roësel (see Mr. Curtis's text), Fabricius, Haworth, Stephens, &c. agree in describing it

as red, with a brown dorsal line: we have never seen the larva ourselves. 3. *Eristalis nubilipennis.* 4. *Halictophagus Curtisii.* A new insect, of the singular family *Stylopidæ* (making the fourth), discovered by that eminently successful and ardent entomologist, Mr. Dale.—Nos. 109 and 110 are published together: they contain, 1. *Endromis versicolor.* ♂ . ♀ . and larva; the latter does not convey to us an idea of the insect. 2. *Cardiapus Mathewsii.* (*Haltica olim.*) 3. *Emphytus fasciatus.* 4. *Phora abdominalis.* 5. *Tasgius rufipes.* 6. *Acrydium subulatum.* 7. *Leptogramma irrorara.* 8. *Oxycera Morrisii.* In the characters of *Acrydium*, Mr. Curtis seems to have made some mistake: he says, "*Thorax* forming a narrow band, with a keel down the centre." We do not know to what part the term thorax is here given. "*Scutellum* sometimes much longer than the body," &c. The elongated part is the *prothorax*; the part known as scutellum is completely concealed. Mr. Curtis henceforth intends publishing his works every alternate month, each number to contain eight plates.

2. *The Book of Butterflies and Moths.*—This is a work of two volumes, "with numerous coloured engravings on wood," to each of which the cunning designer has, with very great judgment, applied a name, although in this nomenclature, from the author's presumptuous attempt to dip a little into entomology, he falls into singular mistakes now and then. The book *will* open at one place, which, though we have seen it twenty times, still excites a smile: it is a representation of something like a striped bolster, and above it a ninepin; the author facetiously calls this pair, "the *larva* and *caterpillar* of the pink under-wing moth;" which is which we have not yet made out. A few pages further, we are told that "the *moth* assumes the *imago* state in May;"—and many other such wonders we find scattered up and down. The truth is, that *Captain* Brown seems to derive his information from *Professor* Rennie's works; and "when the blind lead the blind," the consequence may be inferred. Let us not, however, deny the book its merits; it is a cheap pennyworth; and if the plates are not representations of *particular* butterflies and moths, yet they are pretty, and would be likely to inspire a wish to know more about these things; and if the science of the work

is not deep, there will yet be found some extracts from other authors, which will not only prove interesting, but instructive.

3. *Annales de la Société Entomologique de France: trimestre* 1, 2, et 3.—We hail with delight the establishment of an Entomological Society in Paris, and sincerely hope that the example may shortly be followed in this country, where the taste for the study seems to be every day increasing. Three numbers of their Transactions have already been published, which we most cordially recommend to the notice of our countrymen. Amongst the contents we observe, "Opening Discourse, by M. Latreille;" "Observations on the mode of writing Papers on Natural History, particularly Monographs, by M. Godet;" "Memoir on Gorytes, by M. Pelletier de Saint-Fargeau;" "Notice of a new Genus of Homoptera, by M. Laporte;" "Monograph of a new Genus of Curculionidæ, by M. Chevrolet;" "A new Classification of the Family Longicornes, by M. Audinet-Serville;" "Observations on Bombyx Pitiocampa, by M. de Villiers;" "Monographs of two new Genera of Curculionidæ, by M. Chevrault;" "Description of a new Tetralobus, by M. Gory;" "Memoir of some new Genera of Homoptera, by M. Laporte," &c. &c.

4. *Revue Méthodique des Insectes de l'Ordre des Orthoptères, par J. G. Audinet-Serville.*—This clever little essay has been previously published piece-meal in the "Annales des Sciences Naturelles," but now for the first time appears as a whole. The *Orthoptera* are divided into seven families, *Forficulaires*, *Blattaires*, *Mantides*, *Spectres*, *Grylloniens*, *Locustaires* and *Acridites:* we may observe that *Mantides* and *Spectres* seem to us scarcely to constitute two separate groups, being in every respect so nearly allied; we also feel at a loss how to account for the omission of the genus *Thrips*, which appears to us decidedly Orthopterous.

5. *Centurie de Lepidoptères de l'Ile de Cuba, par M. Poey.*—The figures in this work are well engraved, but it strikes us, rather indifferently coloured. The most remarkable insect figured, is *Mastigophorus Parra*, one of the family *Pyralidæ*, with palpi which are considerably longer than the whole length

of the insect exclusively; it appears nearly related to our genus *Polypogon.*

6. *Magasin de Zoologie, par M. Guerin.*—We have again been highly gratified by our inspection of this beautiful work; the figure of *Hipocephalus armatus* of Desmarest, is well worthy of notice; and M. Laporte's "Essay on the Systematic Classification of the Heteropterous *Hemiptera*," should be studied attentively by all who purpose paying attention to this section of insects; it is succinct, clear, and exceedingly clever. M. Laporte divides the Heteropterous *Hemiptera* into two tribes and fourteen families. We cannot too highly recommend this Magazine to the notice of British naturalists, and sincerely wish to see a taste for the scientific researches of our neighbours more cultivated in this country than it is at present.

7. *Annales des Sciences Naturelles, par M. Audouin.*—This work is continued with spirit and talent; in the number before us we find a paper on the same minute tribe (the *Chalcides*), which our highly valued contributor, Mr. Walker, is now for the first time bringing into notice in this country. To an entomologist, above all men, diminutive size should be no objection. In another number (the last) we find some excellent observations on the anatomy of the flea, by M. Dugés.

8. *Magazine of Natural History.*—This useful and highly entertaining Magazine is continued with its usual spirit: lately we have observed some excellent papers on Crustacea, &c. by Dr. Johnston, a most scientific and persevering naturalist; many interesting scraps on birds, insects, &c. by the Rev. Mr. Bree; a valuable paper, by Mr. Yarrell, on some new British Mammalia, &c. &c.: but the most delightful feature in the Magazine, is a series of letters by our correspondent, Rusticus, commencing in the September number. We do not know which of these most to admire, they are all so exactly to our taste, and we congratulate our contemporary on the acquisition of such a writer; we might envy him, but that Rusticus is doing the same for us, though on a somewhat different subject; and we content ourselves in the belief, that if "Something about Birds" be more beautiful, "Observations on Blight" will be more useful. The entomological papers in Mr. Loudon's

Magazine have been rather weak. In September we observed a very dry, and we think useless paper, by Mr. Huish, about bees. In the March number, our correspondent, Mr. Westwood, has a paper, giving Mr. MacLeay's, and Messrs. Kirby and Spence's calculations of the supposed number of insects: he continues the old error of supposing the *Coleoptera* so greatly superior to the other orders of insects in point of number. Mr. Westwood has appended some characters of Hymenoptera (we do not see the connexion between the subjects), in which, unwilling as we are to criticise, we must notice a few errors, lest it be thought by our friends that we have not observed them. *Agonioneurus*, W. is *Aphelinus*, Dalman; the wing and antennæ appear to be copied from that author; the name, moreover, is inappropriate, as in the wing of this insect the stigmal *does* form an angle, though a slight one, with the subcostal nervure. *Choreia nigro-ænea* is probably the female of *Encyrtus hemipterus;* the abbreviated subcoriarious *wings* of this insect, Mr. Westwood describes, as the sides of the mesothoracic *scutellum*, which part, he says, is *quadrate*, whereas it is really *triangular*, with the apex acuminated. *Hemiptarsenus fulvicollis*, W. is an excessively common little insect, and has two remarkable characters: first, the variation of the colour of the thorax, two being seldom found alike (bright green is perhaps the prevailing colour, which, by the by, makes *fulvicollis* a bad name); and, secondly, the beautiful snow-white tips to its antennæ: neither of these characters are noticed.

9. *Monographie der Carabiden Von Zimmermann. Erstes. Stück.* 8vo. *Berlin et Halle*, 1831.—The *Carabidæ* have been more attended to by entomologists than any other family of insects; an immense number of new genera and species have been published within the last two or three years, by Dejean and others; indeed, the genera and species of all insects, especially of Coleoptera, have been rapidly increasing lately, while their general arrangement has been comparatively neglected. It would tend much to simplify and perfect the system, if *natural orders*, on the plan of Jussieu's excellent arrangement of plants, were adopted. This work is written in German, with a very short Latin notice of each genus and species. The *Zabroides*, the subjects of the present essay,

are divided into five genera; viz. *Eutroctes*, *Zabrus*, *Pelor*, *Polysitus*, and *Acorius;* and though the author only describes twenty-six species, the work extends to seventy-six pages. It would have been more generally useful if he had written it entirely in Latin, and had given the names of the authors on the same subject, and the synonyms. His second essay will be on the *Amaroides*.

10. *Versuch einer genauen beschreibung der in Schlesien einheimischen Arten der Familie der ruderwanzen Ploteres. Latr. Von T. E. Schummel. Mit. 4. Kupfertafeln. Breslau,* 1832.—An excellent monograph on the genera *Hydrometra*, *Velia*, and *Gerris*, constituting the family *Ploteres*, Latr.; accompanied by numerous and accurate dissections and figures. Several new species of *Gerris* are described, and their variations are well exhibited in the last plate. The author gives complete synonyms of the genera and species.

11. *Versuch einer genauen beschreibung der in Schlesien einheimischen Arten der gattung Raphidia. Linn. Von T. E. Schummel. Mit einer illuminirten Kupfertafeln. Breslau,* 1832.—An essay much on the same plan as the preceding. The author describes four species (two of them new), the nervures of whose wings often vary in the same specimen. The species described are: 1. *Ophiopsis*, Linn. 2. *Crassicornis*, Hartlich. 3. *Notata*, Fabr. 4. *Xanthostigma*, Schum.; the two latter are common near London. The plate represents the wings, head, &c. of each species.

12. *Observationes de speciebus nonnullis generis Mycetophila vel novis, vel minus cognitis scripsit F. H. Stannius. Med. et Chir. Dr. Accedit tabula ænea colorata. Vratislavia,* 1831.—An interesting monograph on the genus *Mycetophila*, which the author appears to have thoroughly studied. This group belongs to the *Tipulariæ Fungicolæ*, in which he has also included *Leia*, *Sciophila*, *Sciara* or *Molobrus*, and *Cordyla*. He gives an account of their habits and economy, and observes that their larvæ are intimately allied to those of Lepidoptera, while they differ from other Dipterous larvæ, in having the stigmata placed together on the side of each segment, and in some other characters. He says that this formation

is common to all the above-mentioned genera, and that he has also observed lateral stigmata in the larva of *Cecidromyia*. Eight species are figured, and twenty-three described, fifteen of which are new.

13. *Die Arachniden-Getreu nach der Natur abgebildet und beschrieben Von Dr. Carl Wilhelm Hahn. Erster Band.*

14. *Die Wanzenartigen Insecten. Getreu nach der Natur abgebildet und beschrieben Von Dr. Carl. Wilhelm Hahn. Erster Band. Mit sechs und dreissig fein ausgemalten. Tafeln Nürnberg*, 1831.—The first number of each of these works was published in 1831; of the second, we have just received a second number, and we understand they are to be continued. Each has six plates, with coloured figures. The first illustrates some of the genera and species of *Arachnida*; a few sketches of the positions of their eyes are also given. The second is very similar to a work published, by the same author, several years before, and contains figures of the genera and species of *Hemiptera*, with sketches of their heads, trophi, antennæ, and nervures of the wings, magnified. The figures, in all the three numbers, are accurately, though in some instances, rather coarsely executed.

15. *Handbuch der Entomologie Von Herrmann Burmeister. Erster Band. Allgemeine Entomologie. Mit* 16 *Steindrucken und erklarenden Text in Quart. Berlin*, 1832.—This volume, containing nearly seven hundred pages 8vo, is divided, by the author, into four sections. The first treats of the Terminology or Orismology; the second, of the Anatomy; the third, of the Physiology; and the fourth, of the Taxonomy, or system of insects. Our limits will only allow us to give a short list of the contents of the book. His first section contains three chapters; in the first, he speaks of the basis of Orismology; the second chapter is devoted to general, and the the third to partial Orismology. Observations on the organs of growth, and on the animal organs, occupy the second section. The third, containing above three hundred pages, is divided into three parts, the first describing the physiology of the body, which he calls "*Somatische Physiologie;*" the second, that of the soul, or instinct ("*Psychische Physiologie*"); and the third, the geography, &c. of insects. The fourth

section is upon systems: those of Aristotle, Gesner, Ray, Lister, Linnæus, De Geer, Geoffroy, Fabricius, Illiger, Clairville, Cuvier, Latreille, Lamarck, Dumeril, Leach, Kirby, Oken, MacLeay, &c. are described; and he gives a short account of a system of his own. He concludes with a few pages on nomenclature, and a table containing lists of the different thoracic parts, according to his views, and those of Knoch, Kirby, Chabrier, Andouin, MacLeay, and Straüs-Durckheim. This work is accompanied by an atlas, containing sixteen anatomical plates, copied from other authors, some of them coloured. We recommend this book to the attention of all who wish to extend their information beyond the mere descriptions of genera and species, which is too often the *ne plus ultra* of the researches of British Entomologists.

Art. XXXV. — *Varieties.*

(Continued from p. 216.*)*

24. *Inquiry respecting the Genus Castnia,* (Vid. ante, p. 44.)—Sir, Permit me to request, from the anonymous reviewer of "*Sphinx vespiformis,*" some information on the natural history of the genus *Castnia,* which he intimates he has seen in its native country, "sitting with its wings deflexed, *as we have ourselves observed,*" (p. 46.) This fact was published many years ago, (*Zool. Ill.* 3 Pl. 149); but it has never been confirmed, until now, by the observations of others. Your correspondent must, of course, be a traveller in equinoctial America, where only this genus is found; and can probably communicate something more on this singular group than I have published. Allow me to express the pleasure I have derived from your first number, and my hope that it will be effectually supported. The first article deserves the highest commendation.

I am Sir, your very obedient Servant,

William Swainson.

St. Albans, Nov. 25, 1832.

[We are sorry that we are unable to afford Mr. Swainson any further information on this interesting subject.—Ed.]

25. Singular mode of capturing Noctuæ.—I would recommend to your readers a plan, by means of which I have captured many good Lepidoptera, as will be seen by the list I send herewith. It is simply to lay a sugar-hogshead, which has just been emptied, and to which of course some small quantity of sugar will still adhere, in an open space near a garden or field. In the course of a night or two it will be visited by numbers of Noctuæ, amongst which will not unfrequently be found some of the rarer species. The Noctuæ continue to visit it, particularly on moist evenings, as long as it retains any saccharine matter.

Yours, &c.

E. Doubleday.

Epping, Nov. 21, 1832.

Callimorpha miniata
Lithosia complana
Triphæna orbona
pronuba
innuba
fimbria
interjecta
Janthina
Cerigo texta
Lytæa umbrosa
Agrotis æqua
segetum
suffusa
nigricans
exclamationis
Graphiphora augur
brunnea
punicea
C. Nigrum
plecta
Semiophora gothica
Orthosia litura
pistacina
Orthosia macilenta
upsilon
Mythimna grisea
Segetia xanthographa
Caradrina alsines
Sepii
cubicularis
glareosa
Glæa Vaccinii
polita
Amphipyra pyramidea
Pyrophila tetra
Nænia typica
Xylina putris
Xylophasia lithoxylea
polyodon
rurea
epomidion
Hadena plebeia
Mamestra oleracea
Brassicæ
aliena
persicariæ
Apamea rava
oculea
I-niger
Miana Æthiops
strigilis
humeralis
Miselia oxyacanthæ
Polia advena
seladonia
Acronycta Psi
tridens
Bryophila perla
Bombycia viminalis
Cosmia diffinis
trapetzina
Xanthia flavago
Leucania impura
pallens
Phlogophora meticulosa
Abrostola urticæ
triplasia
Mormo Maura
Catocala nupta

26. Genus Amphimalla. (*Vide ante*, p. 84.)—Sir, So far from suppressing my learned friend, M. Latreille's, genus *Amphimalla* (which may be termed a sub-genus), I have given the characters of it under my third division, Vol. IX. p. 406. On an inspection of the foreign species of *Melolonthidæ*, the antennæ will be found to vary so much, that if generic names be given where the antennæ differ, it must be done to a

very great extent; and it is as well to bear in mind, that it will be simplifying the science to form divisions, and not genera, when the groups are not unmanageable from their extent. It will be seen, from my characters of the other two divisions, that it might, on the same principle, be contended that *M. vulgaris* and *M. Fullo* should each have a generic name; but such a step would, I think, be actual folly. You will see, in the *errata* of Vol. IX. published this day, that since *Melolontha* was illustrated by me, I have had a female of *M. solstitialis* sent me by a friend, by which means I learn that I was unacquainted with that sex before, and beg to subjoin the corrected definition of M. Latreille's genus.

> Amphimalla.—Antennæ 9-jointed, 3 terminal joints forming the club, which is very small in the female; the legs differ in the sexes as in the other species, being dentate or spined in the female.

There must be something different in the habits of the sexes, for I examined nearly twenty specimens, which had been retained from many scores, taken at different times and places, and, from their varying in size, I presumed I had both males and females; but it appears I had none of the latter sex. I think it is very probable that they were all taken on the wing, and if that were the case, it may be inferred that the females seldom fly, and that the swarms that we see of these insects in the evening are either flying about, or in search of their partners. I am, yours, &c.

John Curtis.

December, 1832.

27. *Singular Instinct in a Spider.*—In a walk, after breakfast, this morning, in our little garden at Kennington, I was much delighted by the contrivance of a small garden spider: she had formed her web over the middle of a gravel path, attaching the supporting threads to the paling, on one side, and to a sunflower on the other. The breeze was rather strong; and, to keep her web steady, she had drawn up a small gravel stone, though very nearly the size of her own body, which hung beautifully poised between two threads, about a foot above the path, and which answered the purpose she wished most admirably well; it swung backwards and

forwards with the motion of the wind, but still was heavy enough to keep her web distended and steady. I placed a sheet of paper underneath, to catch the stone when it fell, and have it now in my possession.

E. T. Foster.

Dated August 27—received December 4, 1832.

28. *Inquiry respecting the preservation of Crustacea.*—Sir, Will you have the goodness of informing me, through your magazine, what is the best mode of preserving shell-fish, as crabs, &c. I have excellent opportunities of collecting them, but they invariably become moist, and decay at the joints. Your obedient servant.

December, 1832. Devoniensis.

[We believe that the most effectual mode of preserving Crustacea is to clean the shells thoroughly, and then keep them steeped in fresh water, until the salt is completely extracted from them. Mr. Yarrell or Mr. Stephens could furnish much better information than ourselves on this subject. We should feel obliged by any communication from them on the subject.—Ed.]

29. *Coccus of the Vine.*—I have found on the shoots of the vine an insect which adhered to them, in form and colour something like a flat insect I have frequently met with on the head of prawns. When I saw them first, they were very flat, and close to the branch, but they increased in bulk much more upwards than in circumference; and, after some time, I have picked them off, and found that they contained a white cottony substance, and a great many young red spiders. I never saw them in any other state than this. I have destroyed great numbers, considering them prejudicial to the vine, by injuring the sap. I never remember seeing any of the old ones, nor indeed any others than what were in the cottony substance, which I considered the nest. Any information on the subject will oblige G. N.

[The insect is the female of the *Coccus vitis;* the red spider-like insects are the young, which hatch from eggs, deposited on the stem of the vine, and thus protected from

harm by the body of the mother. We hope our correspondent Rusticus will include a history of this singular creature among his valuable "Observations on Blight."—Ed.]

30. *Larva of Crœsus septentrionalis.*—I have more than once found this larva in abundance on the hazel, in the beginning of July and the end of August. It is gregarious, and remains most of the day at rest, on the margins of the leaves, in the attitude represented in the drawing by my friend Newman. Last July I observed some young hazels nearly stripped of their leaves by these larvæ, but apparently most of them had changed to the pupa state, as scarcely any were to be found on the few remaining leaves. Although the larva is abundant at times with us, yet I have rarely found the imago. The plate so well exhibits the form of this larva, that any description of it would be superfluous. (See pl. 1. fig. 5.)

Edward Doubleday.

31. *Metamorphosis of Aleyrodes.*—Since Reaumur, no entomologist seems to have met, in the larva or pupa state, with *Aleyrodes Proletella;* and the opinion that its metamorphosis resembles that of the *Lepidoptera* has been so general, that it is with much hesitation I venture a doubt of its correctness. Having recently reared it from the pupa which I found on cabbage-leaves, I am disposed to think that it more resembles the coarctate pupa of some *Diptera;* but as I had not the opportunity of paying sufficient attention at the time, I merely throw out this hint in the hope that some more able entomologist may take the pains to examine the larva and pupa of this remarkable insect, which I have no doubt will be found in abundance throughout the summer, under the leaves of the rough-leafed variety of the common cabbage.

Edward Doubleday.

Epping, December, 1832.

32. *Larva of Lyda sylvatica, &c.*—When my friend Davis was at Blackheath, last summer, he found a nest of the larvæ of *Lyda sylvatica* feeding in a web, on the leaves of a pear-tree; he kindly gave me specimens, one of which I have drawn: it is remarkable in being entirely without the abdominal legs (see pl. 1. fig. 4). Another yellow larva, with

fourteen abdominal legs, which I found in great abundance on poplar-trees, produced *Nematus dimidiatus* (see pl. 1. fig. 1). On the *Scrophularia aquatica*, in my garden, I obtained numbers of the larvæ of *Allantus scrophulariæ:* it is remarkable for its great change of colour in its last skin; from having been a clear blueish-white, with several rows of jet black spots, it becomes a dirty brown colour (see pl. 1. fig. 2 and 3). The green larva represented, is that of *Crœsus Septentrionalis*, a description of which you will receive from its captor. The accompanying plate is engraved by my friend, Mr. Ingall, and coloured by a gentleman who does not wish his name made public, and most exactly represents the insects above named.

EDWARD NEWMAN.

Deptford, December 20, 1832.

[We beg to express our best thanks to the gentlemen who have gratuitously furnished us with this elegant plate: generosity of this kind can only be returned by every exertion on our part to make our Magazine a worthy receptable of such gifts.—ED.]

33. Generic Names should be of Greek Derivation.—I was much surprised at the admission into your last number of no less than *four* generic names, not derived from the Greek, as is now the universal practice, but being simple Latin nouns and adjectives. I do not think even Mr. Curtis's name of sufficient weight to authorize an innovation, which it was certainly the duty of an editor to have guarded against.

Δ

January 10, 1833.

[We certainly regret that these very unscientific appellations should have escaped Mr. Curtis's notice in the revision of the proofs; for our own part we feel a delicacy in making alterations, which might not, by our contributors, be deemed justifiable: our reader will perceive at once that our correspondent must refer to *Silo*, *Chlamydatus*, *Loricula*, and *Galeatus*. We select Delta's observation on this subject as the most temperate one of four, and because we are sure it is written with no unfriendly feeling either towards ourselves or Mr. Curtis. XYZ., who says that every genus, excepting *Paramecosoma*,

described in the article alluded to (XIX. p. 186), has been previously characterized, must supply us with references in proof of the assertion, otherwise his communication is what he is pleased to term Mr. Curtis's,—"waste paper." We however caution our correspondents not to allow their zeal in making genera and species to overstep the real object of such labour,—the elucidation of the science. With the elegant epistle (on the article in question) which dared us to omit its publication, we lighted our cigar; we heartily wish all entomologists were as willing as ourself to smoke the calumet of peace.—Ed.]

34. *Aphides produced in the winged state.*—Having paid much attention to the hop-fly during the last summer, I was not a little surprised at observing that the young of that insect are born *in the perfect state,* and that some of them are actually provided with wings.

J. B——, Jun.

Worcester, January 19, 1833.

[This fact, we believe, is new to entomology; we therefore beg to say we are personally acquainted with the writer, and cannot doubt his veracity.—Ed.]

35. *Ignis fatuus.*—The insects which were found (see p. 216) in digging up the mud of an old pond, must have been the larvæ of some large *Libellula.* I am surprised you should think they were the mole-cricket; for though that insect frequents damp situations to a certain extent, I never heard of its burrowing in the mud of a pond. I forbear making any observation on that strange phenomenon, but I have long thought it to be the *Libellula.* James W. Bond.

[Mr. Bond furnishes us with many remarkable instances of tenacity of life in insects; the most remarkable of which is one of a moth (*Phlogophora meticulosa*) which appears to have been caught flying about without a head, and which lived in that state about thirty-six hours.—Ed.]

36. *Motion of legs, &c. in Water-beetles.*—Having brought home, a short time since, a number of water-beetles alive, I put them into a large white bason, for the purpose of observing their actions: I found that all the carnivorous beetles

(natural order *Dytiscites*, including the well-known genera, *Dytiscus*, *Colymbetes*, *Acilius*, *Hydroporus*,) in swimming, moved both their hind legs simultaneously, striking out with great vigour, in the same way as a frog; whereas the herbivorous beetles (natural order, *Hydrophilites*; genera, *Hydrous*, *Hydrophilus*, *Helophorus*, &c.), in swimming, moved their hind legs alternately, thus making weaker strokes, and progressing in the water much more slowly. There is yet another difference between the groups, which, however, I believe, has been before observed; it is, that the *Dytiscites* porrect their antennæ in swimming, and conceal their palpi; the *Hydrophilites*, on the contrary, porrect their palpi, and conceal their antennæ. EDWARD NEWMAN.

Deptford, Jan. 20, 1833.

37. *Inquiry as to the collecting Apparatus.*—Sir, It was with great pleasure I became a subscriber to the "Entomological Magazine," hoping to find in it some few instructions and hints to young entomologists; but meeting with disappointment in this, I have written this letter, humbly requesting you to devote one or two pages for the benefit of tyros in the science. I shall feel much obliged by your informing me where, in London, all apparatus necessary for collecting may be purchased, and what particular nets, &c. you recommend, with any hints you may think useful, either for collecting or preserving insects.

I remain, Sir, your respectful subscriber, J. D.

Dartmouth, Jan. 1833.

[We intended to do this, but our correspondent must observe how very little editorial matter we are able to publish, owing to the press of more important communications. We obtain our own nets, &c. of Mr. Bew, 19, Newgate Street; we are not aware of any other maker. J. D. will find ample directions for collecting in Messrs. Kirby and Spence's "Introduction to Entomology," to which we beg to refer him for the present.—ED.]

38. *Insects captured at Bridgend, Glamorganshire.*—Sir, I have to request that you will put my name down as a subscriber to your excellent and long wished for Magazine. At the same time I have embraced the opportunity of sending you

a list of insects collected in the vicinity of Bridgend, Glamorganshire, from last May to September. They were all captured in a circle of about three miles round that small town. Two parts consist of different species of limestone, one of coal-mines, and one of sand-hill or sea-coast. The larvæ of *Lasiocampa trifolii* I found in plenty at the end of May, in all stages of growth, on the sand-hills; their natural food is the *Lotus corniculatus*, or bird's-foot clover; although they eat freely, and thrive, still the moth is difficult to rear, as the larvæ mostly die in transforming to the pupa state. *Thecla Betulæ*, *Pieris Cratægi*, and *Melitæa Artemis*, were in profusion last year. I shall be happy to exchange any *Coleoptera*, *Diptera*, *Hymenoptera*, &c., for *Lepidoptera*, and am, Sir,

Your most obedient servant,

CHARLES BLOMER, Capt. — Regt.

LEPIDOPTERA :—
Thecla Betulæ
Pieris Cratægi
Melitæa Artemis
Lasiocampa Trifolii
Bombycia viminalis
Caradrina trilinea
Cymatophora subtusa
Polia bicaudata *
herbida
Actebia Præcox
Agrotis Cunigera
Coclylis Baumanniana *
Pterophorus tetradactylus
Sesia Bombiliformis
Scopula flavalis

DIPTERA :—
Tabanus vittatus *
Œstrus Ericetorum
Tachina fera
Atherix Ibis
Henops gibbus
Asilus germanicus
Ceria Conopsoides

HYMENOPTERA :—
Chrysis bidentata
ignita
cyanea
Bombus Harrisellus
rupestris
Osmia Tunensis
maritima *
parietina
bicolor
Andrena aurata *
spinigera
Eucera longicornis
Mellinus pratensis
frontalis
Psen compressicornis

COLEOPTERA :—
Agonum emarginatum
punctatum *
Ophonus azureus
Omaseus angustior
Elaphrus cupreus
riparius
Clivina collaris
Tachypus Andreæ
Ocys rubens
Nebria complanata
Pedinus maritimus
Nitidula obscura
Haltica affinis
Ægialia globosa
Hister 4-striatus
Opatrum tibiale
Hydroporus flavipes
12-pustulatus
Colymbetes vitreus
paludosus
oblongus
guttatus
Cassida nobilis
Cistela nobilis *
Cicindela maritima
Ocypus brunnipes

HEMIPTERA :—
Pentatoma bidens
Cydnus Morio.

[We have marked with an asterisk several insects with which we are wholly unacquainted, even by name.—ED.]

39. *Rather extraordinary.*—On Sunday, as Mr. William Ferris, of Pennywell Lane, was in his garden, about eleven o'clock in the

forenoon, millions of insects, of the caterpillar species, forming quite a cloud, which darkened the air, passed over him from west to east.—*Bristol Mercury.*—!!! Ed.

40. *Stephens* v. *Rennie.*—This case happening to be the last on the list, at the Court of Exchequer, has been, we are sorry to say, put off till May. On the morning on which it was expected it would be heard, we took a stroll into Westminster Hall, and we think we may say we never saw so many fellows of the learned societies assembled on any occasion: we recognised Mr. Yarrell, Mr. Children, Mr. Haworth, Mr. Vigors, M.P., Mr. Gray, Mr. Samouelle, Rev. Mr. Hope, Rev. Mr. Rudd, Mr. Davis, Mr. Newman, Mr. E. Bennett, Mr. Westwood, Mr. Waterhouse, Mr. Griesbach, Mr. Hanson, Mr. E. Doubleday, &c. &c.; most of whom were, we understood, witnesses for the plaintiff, who, as a matter of course, was present. These gentlemen, after spending nearly the whole day walking up and down the hall, had the pleasure of being dismissed until again wanted. We certainly do not envy any man a law-suit: when the matter is decided, even in the plaintiff's favour, which we have no doubt will ultimately be the case, what damages can repay him the trouble and expense he has incurred? In the mean time, entomologists are inconvenienced by the discontinuing of Mr. Stephens's "Illustrations," which he, of course, suspends until the law has decided whether he has a copyright in them or not.—Ed.

41. *Inquiry respecting Mr. Stephens's "Illustrations."*—Sir, can you give me any information as to the re-appearance of Mr. Stephens's valuable "Illustrations of British Entomology?" At this distance from London, I find it impossible to obtain any information through booksellers, &c. ?

Edinburgh, 13*th Feb.* 1833.

[We may positively state, on the authority of Mr. Stephens himself, that the only cause of delay is the law-suit above alluded to.—Ed.]

42. *Flight of Insects.*—The propensity which insects evince to fly in one direction, is truly remarkable; in the roads through the woods of Kent, I have found that the readiest way to take *Leucophasia Sinapis*, the little "Wood White" butterfly, is to

stand quietly and allow them to come to me; they are slow and very easily captured; and after having observed the direction in which one is proceeding, I could always make sure of many more following in the same track: when I have attempted to turn them back, it has been of no avail, they have passed on one side, or over me, and quietly pursued their course: these roads are cut through the woods in every direction of the compass, and I found the way of the wind had little or nothing to do with the matter, as in some instances their flight was with the wind, and in others directly against it. *Saturnia Carpini*, the Emperor Moth, and *Endromis versicolor*, the Kentish Glory, invariably fly against the wind. During the past spring, I had an excellent opportunity of remarking the habit of the latter beautiful and rare moth; it was about the middle of April, the weather cloudy, and the wind eastward. Being on the heathy common, on the south side of Birchwood, at two o'clock P.M., I observed one of these moths coming directly from the west, with a zig-zag flight, and at a most amazingly rapid rate it passed over my head, and was soon out of sight; for about an hour and a quarter others continued to follow, one at a time, in nearly the same line, all coming like the first, directly from the west, and flying towards the east. I was not fortunate enough to secure a single one, although I learned that several were captured on the same day; probably, one motive for these insects flying in this way, is to detect the females, which are generally dull sluggish animals, and scarcely fly at all. In the autumn, when the ants are assuming the winged state, I have seen myriads of both sexes, crossing the River Thames in the direction of the wind, and moving in a somewhat oblique manner, so as to cause thousands of them to fall in the water, the surface of which was completely sprinkled with their floating bodies: the swarm continued to pass in nearly equal profusion, six hours afterwards, when I repassed the spot, and had probably continued to do so during the interval. In windy weather, *Megachile Willoughbiella*, the leaf-cutter bee, invariably goes to windward of its nest to procure leaves, and returns loaded, with the wind, thus converting a high wind into an assistance, instead of permitting it to be, as one would very reasonably have supposed, a preventative to its proceedings.

Your's, &c. EDWARD NEWMAN.

Art. XXXVI.—*On the Death of Latreille.*

A voice of sorrow floats upon the gale,
'Tis science weeps, she weeps for thee, Latreille!
At length thy bright career is o'er,
Thy honoured voice shall teach no more;
And we, who doatingly have hung
Upon the wisdom of thy tongue,
All eager lest a single word
Should chance to pass thy lips unheard,
That, as a father's to his child,
Instruction poured in accents mild,
Not only to bright science true,
But advocating virtue too—
Now, drop upon thy hallowed bier,
The honest tribute of a tear.

Oh Frenchman! dost thou wonder? wouldst thou know
Whence comes this lay, and whose this strain of woe?
And deem'st thou that no honest hand
Can hold the pen in foreign land,
And thus with grief unfeign'd bewail
Thy own, thy loved, thy lost Latreille,
Nor seek to hide his sterling worth,
Because thy country gave him birth?—
Oh! learn that our impartial eye
Finds merit under any sky;
Our pearls of knowledge have been strung
From every land, in every tongue;
And shall we ill for good return,
Nor let the palm where won be worn?—
No! when our Fire-fly spreads her wings,
An equal light on all she flings;
A guardian banner is unfurled
For merit over all the world!

And, Briton, as thou readest, put to rest
All envious feeling, if such haunt thy breast.
The mighty has resign'd his trust,
The teacher mingles with the dust;
And surely we shall seek in vain
To find on earth his like again.
O, let not then thy niggard frown
Attempt to dim his radiant crown;
But keep his matchless worth in view,
And honour give where honour's due:
Boughs of the weeping-willow bear—
Wreaths of the gloomy cypress wear;
And with us pay thy tribute here—
One heartfelt sigh, one parting tear.

ENTOMOLOGIAE·HODIERNAE·FVNDATOR

PETRVS·ANDREAS·LATREILLE

DIEI·VI·FEBRVARII·OBIIT

A·D·MDCCCXXXIII

THE

ENTOMOLOGICAL MAGAZINE.

JULY, 1833.

ART. XXXVII.—*Colloquia Entomologica.*

(The second and last of the series.)

Γνωθι σεαυτον.

SCENE—*The Parlour at the Bull Inn, Birch-wood-corner.*

Enter ERRO *from mothing; he takes off a bull's-eye lanthorn, and sits, folding his arms.—An expiring fire in the grate.*

ERRO.——

Where rose the mountains, there to him were friends;
Where rolled the ocean, thereon was his home;
Where a blue sky and glowing clime extends,
He had the passion and the power to roam.
The desert, forest, cavern, breaker's foam
Were unto him companionship; they spake
A mutual language, clearer than the tome
Of his land's tongue, which he would oft forsake
For nature's pages, glassed by sunbeams on the lake.

(*A long pause.*)

Like the Chaldæan, he could watch the stars
Till he had peopled them with beings bright
As their own beams; and earth, and earth-born jars,
And human frailties, were forgotten quite.
Could I have kept my spirit to that flight
I had been happy; but this clay will sink
Its part immortal, envying it the light
To which it mounts as if to break the link
That keeps us from yon heaven, that lures us to its brink.

But in man's dwelling I'm become a thing,
Restless and worn, and stern, and wearisome,
Droop as a wild-born falcon with clipt wing,
To whom the boundless air alone were home;
Then comes my fit again, which to o'ercome,
As eagerly the barr'd-up bird will beat
His breast and beak against his wiry dome,
Till the blood tinge his plumage; so the heat
Of my *impeded* soul does through this bosom eat. (*A pause.*)

Poor captive nightingales, how have I watched your oft repeated efforts for liberty, when nature has told you it was time to go! how deeply have I shared in your disappointment! (*A long pause.*)

Enter ENTOMOPHILUS *(from mothing).*

ENTOMOPHILUS. What, moping again! for ever on the dolorous *(sits)*, migratory, I suppose—wrapt in fancy—sighing for ideal good, like the infant stretching out her little hand towards the moon—so—and whimpering and squalling because her nurse can't get it for her.—All the Jewell family a-bed? Are we going to have any supper?

ERRO. Yes, go I *will*—sooner or later; Humboldt was disappointed a dozen times, yet what did he not accomplish at last?

ENT. Shall I summon him?

ERRO. You have not forgotten that hallucination, then; but I am glad to hear you allude to it jokingly.

ENT. Jokingly!—I never was more serious, *(rises and places a chair between them)* say who it shall be.

ERRO. Poor fellow! every man is mad on some point. *(musingly.)*

ENT. A truism, no doubt—your crack induces migratory dreams; but before fixing a crack in my pate, have the goodness to give me a hearing; mention but a name past or present, dead or living—who shall it be?—Stephens?—MacLeay?—Aristotle?—Waterton?—Humboldt?—Dr. ——?

ERRO. Well, call the doctor, then; come, begin the incantation—

Being or spirit,
Whatever thou art,
Who still dost inherit
A whole or a part;
Of the form of thy birth,
Of the mould of thy——

ENT. Nonsense—now mind, if you notice him, or speak to him, before he joins the conversation of his own accord, the spell is broken, and we lose him *(he speaks a few words in a low voice, and* RUSTICUS *instantly occupies the chair placed for him)*. So you are still migratory, not satisfied with old England yet.

ERRO. I have little reason to be satisfied; condemned to kneel before a man whom I despise from the bottom of my soul, because I was bold enough to tell the truth of him. I know every body must hate me for it; but I had my reasons.

RUSTICUS. I feel shivery, all needles and pins, and for all the world as though I had been run away with by the steam-horse that bolted on Ashton Moss the other day, or shot out of an air-gun—shall I stir your fire?

ENT. What country are you particularly thinking of?

ERRO. Any where that truth may be spoken, and the sky is clear.

RUS.——

Kennst tu das land wo die citronen blühn.

ERRO. 'Tis the land of the east, but the land of the west is my aim; Humboldt and Waterton have determined me on that: think of laying stretched at full length in the shade of a group of coucourite palms, covered with scarlet and blue aras; think of the magnificent arborescent *gramineæ* gracefully waving in the breeze; think of clusters of shrubs, whose flowers are almost too brilliant to gaze upon, and each fanned by the tiny wings of a humming-bird, whose ruby crest and emerald bosom seem to emit rather than reflect the luxurious light; while around and above sail majestically the morphos and the swallow-tails; the gay *Hesperidæ* flit, or rather skip from flower to flower, and the long-winged Heliconians flutter, owl-like, on their way: all nature is on a lavish scale; each rough stem glows with the blooms of parasitic *Orchideæ*, or bends with the weight of luxuriant purple passion-flowers, and scarlet *Bignoniæ*, while the graceful heavily-waving leaves of the cocoas, or the still more beautiful palms of the Oronoco, mingle with the light pinnated foliage of *mimosæ*, and giant tree-ferns, undulating beneath a sun which, for weeks and weeks, has not been hidden by a cloud. O, that I could transport myself to some such lovely spot—

> Where a leaf never dies on the still blooming bowers,
> And the bee banquets on through a whole year of flowers;

where I might always be learning something new; something calculated to place the omnipotence of our Creator still more forcibly before me; something to make me feel, still more strongly, my own nothingness: — even now, when disappointed hope, when misfortune, nay disgrace, arising from my too thoughtless disposition; when sorrow for the death of those who were my friends in the happy days of my childhood, who played, and who studied with me; even now, broken down by trouble, the hope that I may live to pass a few years in the majestic solitudes of the Andes, chains me to a life, to me almost as irksome as it is valueless to others.

Ent. 'Tis a glowing picture; but is there no alloy, no drawback?

Erro. Yes, there is; and I have often shuddered at the thought. What think you that it is?—the poisonous rattlesnake basking in the sun? — the deadly *Bothrops*, lurking under a large stone when I turned it over for a Carab?—the great Boa, swinging like a pendulum by his tail from a tree; or the forest all a-howl with jaguars? No, none of these; but, that I should have to see such beings as *Nestor* and *Eurylochus*, and *Menelaus*, a constant prey to a fly-catcher, as brilliant as themselves, which, taking his station on a dead twig, darted off, and seized them as they approached——

Rus. Then, returning again to the very same twig, with that glorious *Menelaus* in his bill, sever those four resplendent wings, and drop them, gently hovering, and often flickering upward a moment in the eddy of a tropical air-current, as if again endowed with life; wavering and shifting colour; now black, and now a blaze of blue; at last, sinking to the earth, which henceforward they must adorn no more.

Erro. O, Doctor, don't dwell on it; there is something to me so mournful in the idea of any thing so lovely perishing; but it is the fate of all that is beautiful.

> Καὶ τὸ ῥόδον καλόν ἐστι καὶ ὁ χρόνος αὐτὸ μαραίνει·
> Καὶ τὸ ἴον καλόν ἐστιν ἐν εἴαρι καὶ ταχὺ γηρᾷ·
> Λευκὸν τὸ κρίνον ἐστὶ μαραίνεται ἀνίκα πίπτῃ·
> Ἃ δὲ χιὼν λευκά, καὶ τάκεται ἀνίκα παχθῇ.

ENT. There's gibberish! The unknown tongue, no doubt.
RUS. (*musingly.*)

The crimson rose, the bulbul's bride,
The purple violet in the shade,
The lily white, the maiden's pride,
Alike are bright, alike must fade.
The beauteous flake of purest snow
Its very being must forego.

ERRO. Yes, Doctor, that's it; and seeing any thing perishing makes me melancholy; it tells me that I too am perishing; that youth, though pleasing, is soon gone; it seems to make me feel how little hold we have of this world; and that, short as is our time here, our pleasures must be shorter still;—and beyond this world, what are my prospects? If now I look back with regret at the past, what would be my feelings in a future state of existence!—for there *is* a future. I have done nothing—not one *good* action, that is for the *general good* of mankind!—and that, Doctor, is the only true source of pleasure, and should be our aim in every thing.

ENT. Erro, you extract poison from the most delicious flowers; you gorge yourself with vapourings and musings, which, though pleasing, from your love of melancholy, vitiate your taste for the wholesome exercise of your powers. Awake, man, awake! Arouse yourself! Up—up; constant mental occupation is the surest, the safest source of earthly happiness.

RUS. Yes; and if your soul longs to hold communion with Nature, go into the fields and the forests of England; she has not deserted them; fret not for ideal regions.

ERRO. Ideal! There is an intensity of truth in all I think or say of them. Then would the publication of my discoveries do no good?

RUS. You might do as much here: it has been my aim also to do good after my own measure; little is expected from him who little has: from my infancy I have delighted to be alone with Nature; there is a sound of sweet music in her voice; and the pleasure that she gives me I have tried to impart to others;—but what can the pen do, when the heart is overflowing? O, could I find words to describe all that I have seen and noted, there should be no end of the letters of

Rusticus! — but it is impossible. Every moment of a fine spring morning is a chapter in the book of nature; every act of nature is a homily. The little lark, which long before the blush of morning tinges the sunward edges of the fleecy clouds —shakes the dew-drops from his spotted and guileless breast; and, with a voice, at first inward and low—rises on hovering wing, up, up into the heavens; and, as he mounts higher and higher, swells his notes, singing and soaring,—sing-ing and soar-ing, quiver, quiver, quiver, qua-ver—till lost to sight in the dusky twilight, his voice falls like enchantment on the ear, so melodious, so clear, so distinct is every—even its slightest modulation. Does not, I ask, that sweet bird, thus pouring forth——

Ent. —his earliest hymn, his morning soul, his first joyous warbling to his Maker,—Does not, I ask, that sweet bird offer a lesson to the man who can read it?—Does not he pass a sentence of bitter, bitter condemnation — the more bitter, because unintentional, on the man who will not read it; on all who refuse to listen to him, and to those who tell of him—and refusing, harden their hearts against the voice of Nature, and the voice of Nature's God?

Rus. Not unbeautiful; but what right have you to hoist me out of my say in that way?—you should have let me come to an anchor out of common politeness.

Ent. It was unintentional, I assure you, Doctor; it escaped me unawares.

Rus. You are for all the world like the young cuckow, that balances the featherless and blind eggling of the hedge-sparrow on his shoulders, and, clambering up the side of the nest, chucks him off by a jerk, out of his own warm, snug, cozy, comfortable habitation, and keeps it for himself.

Erro. No, no; rather like the milk-tree of Venezuela, so full of riches, that at the least excitement, at a mere scratch, it overflows.

Ent. No, no, neither; it was unintentional; I hardly knew I spoke;—so will a straggling and unbidden thought now and then escape from its most secret sanctuary, and, wandering to the cheek of beauty, reveal itself in a blush; I pray you, pardon me.

Rus. We are metaphorical;—metaphors thrown in with judgment are ornamental; and the writer or speaker who

manages them, will enlighten his subject as the spring brightens the face of Nature, by strewing the earth with flowers.

Erro. Or as Nature herself adorns her favourite regions, the tropics, with her radiant birds, her gorgeous flowers, and her glorious insects.

Ent. Or as Juno, in her stately queenlike walk through heaven, showered her track with inextinguishable stars.

Rus. *Via lactea*, a thing I never look on without a recurrence to that beautiful fable; but of all heavenly sights, the *aurora borealis* is to me the most beautiful; here it does not exist; but in Sweden, and the north of Russia, the frozen face of the snow is lighted up by it with inconceivable splendour. It begins soon after sun-down, and rising in the north, at first somewhat like sheet-lightning afar off in the horizon, spreads fan-like to the zenith, and at last wraps all the heaven in a shooting, shifting, flashing, varying, all-coloured light, and tinges the earth with the reflection of its hue.

Erro. Russia and her ice-palaces have no temptation for me.

Ent. Think of the bears'-paws for breakfast, Roey.

Rus. And think of the bear-hunts. I have speared the tusky pig in his native Hartz; I have chased the bounding chamois on his native Alps; I have fought hand to hand with the majestic desert-king on his native Zaara; and here I have not scorned the insipid inanity of pursuing the stag, the fox, the otter, and even the gentle hare; but a bear-hunt, with all its pomp and circumstance, is the hunt for me.

Erro. I feel no great desire to witness one. I suppose half-a-crown would purchase the sight any day in London.

Ent. Thanks to Joseph Pease, those disgusting, disgraceful, inhuman, brutal exhibitions are put an end to.

Rus. To his honour be it spoken; but what resemblance has the worrying with curs a mangy bear, closely chained against a cellar wall, to the pursuit of the same animal in his native forests?

Ent. Where for a century he has stalked sidling along, undisputed master—none.

Rus. I had been six months at St. Petersburgh without seeing a bear-hunt, when the Emperor announced it to be his pleasure, that preparations should be made for one; and, much to my satisfaction, an express invitation was sent me

to join the cavalcade, which I was not backward in accepting, as you may suppose.

ENT. Tell us all about it.

RUS. The first thing is the finding of the bears, and this is managed by fellows that go out two or three days beforehand, or else the Emperor and all his cavalcade might be frozen to blocks of ice before they would see the shaggy hide of a single bruin. These finders, six or eight in number, are mounted and armed; and no sooner had I heard about their office than I fixed to be one of the company. The Emperor heard of my valiant resolution, and most courteously sent his messenger to examine my equipments and garniture. The messenger made his observations, took notes, bowed, and departed, as I thought, quite satisfied that my appointments were perfect. I was mistaken: in about two hours he returned with a peasant leading a horse, and carrying a whole tout of paraphernalia. The horse was a perfect picture, bigger than our Shelties and rather less than our stocky Welsh breed, and much stiffer than either; the hair all over his body was at least six inches long, rough, and slightly curly, in fact he was as much like a bear as a horse, and I have no doubt the natural orders *Ursites* and *Equites*, meet each other in the natural system; the animal in question, *Ursoides Cossacus*, Lin., being osculant between them.

ERRO. Moffy, you keep on fidgetting the poker and tongs with your toe,—don't make that noise, the Doctor's very interesting.

RUS. I am fond of philosophizing a little.

ENT. It's nothing to me: it's MacLeay that talks about osculants.

ERRO. To be sure, and natural orders, *Ursites*.

ENT. Well, Doctor, what was there besides the horse?

RUS. *Ursites*, *Equites*, *Porcites*, *Vaccites*, *Ovites*, *Canites*, with *Simiites* central, among which in the heart's core, *Homo*.

ERRO. Is not the Doctor pleasant, Moffy?

ENT. The Doctor is not the only one to deride and criticise a system which—

RUS. Don't stop, man, don't stop,—*which they have not brains enough to understand*,—out with it. Well, to proceed, there was a light rifle slung on a leathern thong to go over the

shoulder; a lance at least eight feet long, with a diamond-shaped steel head; a cutlass and belt; a wallet, stored with provender for man and beast; a bear-skin cap; a ditto jacket, or spencer, if you please; a ditto inexpressibles, and a ditto saddle. I retired and made my toilet in a moment, and re-appeared in costume to the great delight of the messenger and slave of the Emperor of all the Russias. I mounted the charger, slung on the rifle, adjusted the wallet to the saddle, buckled on the belt, and laid the spear in rest,—a boar's hide rest, nicely fastened on the right thigh of the inex, and I declare to you the spear stuck out far enough to run through a half a dozen bears before the charger could come up to one of them. I could not resist the temptation of charging on a young pig, which was mumbling a frozen turnip in my landlady's farm-yard, so I rode furiously at him, the pony's feet ringing on the frozen snow—

Erro.—

Quadrupedante putrem sonitu quatit ungula campum.

Rus. The little half-starved *Porcites*, supposing I was in earnest, bolted through a double window into the kitchen, which did immense mischief, for I afterwards heard that the whole winter's stock of eggs and small beer was frozen solid while the cook was hunting about for something to stuff in the hole. But to the tale. I started with five other hairy centaur-looking fellows, as beautiful as myself, and as the day was clear, the snow solid, the beasts fresh, and I possessed enough Russ to hold sweet converse with my companions, the ride was far from unpleasant. Before night we reached a square building, of considerable size, built expressly for these occasions, and consisting of four bare walls, with a few narrow slits for windows, and a hole in the roof; into this hut we turned, horses and all, lighted a fire in the middle, fed our horses and ourselves, spread our furs, and prepared for rest, having first carefully fastened the immense door. Salvator Rosa or Rembrandt would have immortalized us had they had the opportunity. My companions were most or all asleep, when a wild shriek of horror or fright burst from all the horses at once,—it seemed to crack one's ear-drums, and mine even now tingle with the recollection. The Cossacks sprung on their feet: then came the clicking of the rifle-cocks, and then

a howl without as the unanimous voice of a thousand furies. The slits were manned, and the rifles cracked one after another, and at each report a new howl arose. I was not backward at the sport when I understood it. The moon had risen and made it as light as day; the wolves were dancing and jumping about I should think by hundreds, and so close, that it was impossible to miss them. After every crack, whilst the howl of anguish or rage died away, the puff of smoke sailed off with the wind among the trees of the forest, compact as a balloon, but unimpeded by the boughs. Two hours passed in this way until all had fallen or fled; and what is remarkable, when one of them fell, two or three of these famished and ravenous wretches instantly began to gorge on him,—these became victims in their turn,—and many died with the flesh of their half-living companions still in their mouths!

Erro. Horrible!

Rus. As we resumed our journey the next morning, I was glad to get away and lose sight of the bloody snow; the long tracks which some poor creatures had made, as they vainly attempted to fly from the death they carried with them, made me feel some compunction for the deed.

Ent. They would have felt but little for you, I imagine, had they laid hold of you.

Rus. I reasoned so, and satisfied myself.

Ent. Mr. Grey tells me they are a positive pest, nightly prowling about the farm-yards and courts, even in the environs of St. Petersburg.

Rus. The bears live through the winter entirely in their dens, never coming out at all or eating any thing, but subsisting entirely by sucking their paws. The old father and mother bear, and often five or six young ones of different sizes and ages, live together in one den, which is always under the largest tree they can find; as the snow falls, the hole of their dens very often gets blocked up, and then they set to work and clear it out again, always keeping it open as a breathing hole, so the breath of all of them must come out through it; and as it mounts up among the branches of the trees it freezes and makes little icicles; these in time grow larger and longer, till they all join into one which reaches down to the surface of the snow, on which it rests and forms a huge upright pillar, which is pointed at top, and, as the breath continues to

curl up, grows in size as well as in height, sometimes reaching sixty feet, and being visible at a distance of two or three miles. In the course of a few hours after we started the second day we found two of these pillars; the finders then marked the stems of fir-trees as we passed along, so as to insure the finding of them again without any trouble, and we got back before night to the hut of the wolf slaughter.

ERRO. And did they visit you again?

RUS. Which? the *manes* of the departed pack, or their companions that escaped? Ay! (*Erro smiled blandly.*) We heard them howling at a distance, but saw none; I had, however, the good luck to bring down an enormous elk, as he was gamboling by at a three-quarter gallop, and in the morning, when we turned out, he was devoured all except the horns and a part of the skull, which I brought home as a trophy.

ERRO. What do they measure?

RUS. Seven feet one inch and an eighth from tip to tip.

ENT. Less than the extinct Irish elk: *that* spans eleven feet and three-eighths of an inch.

RUS. What giants there must have been on the earth in those days! Mammoths big as houses; crocodiles as long as the monument, and flying, fiery, scaly dragons, horrible enough to make one shudder: think of their toothed bills!

ERRO. *Pterodactylus.*

RUS. The same: geology has disclosed wonders.

ERRO. It has, indeed; I used to underrate it, but I have read Charles Lyell's book now, and I have altered my opinion;—but we are losing sight of the bear-hunt.

RUS. O the rest is not worth telling; the pomp of the court, and parade of wealth and splendour, of gold, and green, and ermine, and all manner of furs, you may imagine;—then the old father bear issues from his den and stands upright on his hind legs like a human bear; then the firing of rifles, often twenty or thirty before he drops on all-fours; then the spattering of his blood, glistening in the languid sunshine, as it drops on the snow; then his bounding like a calf up to the imperial retinue; then his rearing up again for the attack; then the cleaving of his head by a peasant with an axe; then his exit from the strife, interspersed with an account of his invincible courage, his stoical endurance of pain without a whisper of repining, and the excellence of his hams, scientifically cured;

and all this, repeated, with slight variation, about fourteen times, would furnish you with a very tolerable idea of an imperial bear-hunt.

ENT. What sort of a man is the Emperor?

RUS. A prince; all the people love him; he goes out every where without guards or servants, often with the Empress and his children, and the people just take off their caps when they see him, and sometimes the peasants hurra him. He is a good-looking man, has a fine open countenance, a commanding forehead, and wears large moustaches. He always dresses in the usual green coat and epaulettes of an officer in the army, without any particular distinguishing mark, and—(*the clock strikes the first stroke of twelve, and Rusticus vanishes.*)

ERRO. He is gone.

ENT. And for ever.

ERRO——

As the dew on the mountain,
As the foam on the river,
As the bubble on the fountain.

ENT. And what say you now; are you convinced?

ERRO. It is passing strange!

ENT. These are things, Erro, which, like the cloud shadow transversing the mountain side, pass over us and are forgotten, or seen through an avenue of years, are but dimly remembered.

ERRO. O never, whilst memory retains her seat, can time dim the impression of such a scene as that which we have witnessed.

ENT. A wonder ceases by becoming constant.

ERRO. I felt not the full force of this until it had past.

(*Exeunt.*

Art. XXXVIII.—*Essay on the Classification of Parasitic Hymenoptera, &c.* By A. H. Haliday, Esq. M. A.

(Continued from p. 276.*)*

Fam.—Chalcides.

Trib. 2da.—Spalangiæ.

Tarsi pentameri. Palpi maxillares bi-articulati. Caput nutans longius quam latius. Antennæ prope os insertæ.

Gen. I.—Spalangia. *Latr.*

Caput ovatum, anticè attenuatum margine bisinuato, fronte depressa. Oculi villosi. Antennæ capitis margini antico insertæ, remotæ, 10-*articulatæ,*— maris *filiformes articulo* 3to. *elongato ;*—feminæ *sensim incrassatæ articulis* 3o.—9m. *brevibus, ultimo longiore obtuso. Collare anticè attenuatum. Abdomen ovatum petiolatum.*

Caput fere rostratum, margine antico bisinuato *s.* trilobo os obtegente. Frons latè depressa, plagâ oblongâ planiusculâ in fundo discretâ : ocelli tres in triangulum positi, postici occipitales : oculi mediocres ovati villosi : antennæ—*feminæ* longitudine thoracis, scapo lineari plusquam trientem antennæ longitudinem attigente, pedicello clavato longiore quam articulo 3o. flagelli articulis longitudine decrescentibus et latitudine crescentibus, ultimo præcedentibus 2 simul sumtis longiore, oblongo apice rotundato ; (antennæ reverâ 12-articulatæ sunt sed tres apices arctissimè connati unici speciem facilè exhibent)—*maris* thorace longiores, scapo quadrantem longitudinem æquante, pedicello parvo, articulo 3o. elongato lineari, sequentibus 6 ovatis aut oblongis pedicelli longitudine, ultimo rursus longiore : mandibulæ oblongo-trigonæ apice emarginatæ : mentum obconicum subcompressum, labium breve obtusum integrum—palpi biarticulati articulo 1mo. clavato, 2do. ovato : maxilla scapo gracili arcuato, lobo lato subovato—palpi labialibus dimidio longiores articulo 1mo. clavato, 2do. longiore et graciliore : thorax capite duplo longior et in medio latior, antice constrictus, postice truncatus : collare angustius crateriforme antice attenuatum : mesothoracis scutum anticè globoso prominens collari insertum, lobi humerales discreti globoso prominuli : paraptera lata trigona in medio dorsi conniventia : scutellum planum basi angulatum apice arcuatum, lineâ transversâ profunde punctatâ bipartitum et pari modo a scuto metathoracis discretum : metathorax subquadratus angulis posticis obtusè dentatis : scutello

declivi, undique marginato, cordiformi, longitudinaliter canaliculato: petiolus descendens cylindricus striatus, *mari* longior: abdomen ovatum convexum, thorace fere brevibus et vix angustius, apice obtusum; aculeo brevi valido, parum compresso, desuper exerto: segmenta 2 anteriora longitudine subæqualia, primum basi fossulatum carinulis lateralibus antrorsum productis, 3um. maximum, reliqua brevissima linearia: coxæ magnæ compressæ: femora utrinque attenuata: tarsi tibiis breviores, articulis intermediis minutissimis, metatarsis antico dilatato, posterioribus elongatis: alæ anticæ nervo subcostali[a] dimidiato (*sc.* humerali a margine parum remoto et ulnari longitudine subequalibus) cubito brevissimo perparum dilatato, radio mox abrupto vix illo longiore: posticæ nervo subcostali tenui ultra medium costæ abrupto.

This genus has a slight resemblance in habit to *Megaspilus* as the following to *Microps*.

Sp. 1. Sp. hirta. *Capite thoraceque fere totis punctato reticulatis confertim villosis.* ♀ (Long. corp. .14; alarum .2).

Caput obscure æneum antice magis attenuatum quam in sequente, totum confertim crassè punctatum et villosum, plagâ intermediâ frontis tantum lævissimâ glabrâ: antennæ nigræ quam in illâ longiores et minus incrassatæ, articulo 3^tio^. parum breviore quam 2do: thorax obscurè æneus: collare, mesothoracis scutum et humeri confertim punctati, scuti tantum margine antico levigato: paraptera et scutellum vagè punctata, hoc apice parciùs: metathoracis latera rugoso-punctata, scutellum lævissimum marginibus et canaliculâ mediâ crenatis: squamulæ fusco-ferrugineæ: alæ dilute ferrugineæ nervis fuscis: abdomen et pedes ut in sequente.

Taken in England; I forget the particular spot.

Sp. 2. Sp. nigra. *Capite punctulato (fronte lævissimâ), et thorace anticè suturisque punctato, sparsim pubescentibus.* ♂ ♀ (Long. .1±; alar. .15±.)

Spalangia nigra. *Latr., Spin., Dalm., &c.*

Caput et thorax nigra nitida viridi *s.* æneo micantia: caput vage punctulatum pubescens, fronte latè depressâ lævissimâ glabrâ:

[a] As the variations of the subcostal nervure afford some useful divisional characters, I have employed the following terms to distinguish its parts:—

1. The interior portion distinct from the rib I call Humeral.
2. The costal portion before the fork . . . . Ulnar.
3. The costal portion beyond it . . . . . Radial.
4. The descending branch of the fork . . . . Cubital.

antennæ nigræ ♀ articulo 2do. fere duplo longiore quam 3^tio^.: collare, scuti mesothoracici apex et metathoracis latera vage punctata pubescentia, reliqua fere lævia suturis punctatis *s.* crenatis: abdomen nigrum nitidissimum chalybeo micans, apice pubescens: pedes nigri nitidi, tarsis flavo-ferrugineis apice fuscis: alæ hyalinæ *s.* lutescentes nervis fusco-ferrugineis.

Tolerably abundant throughout both islands, in pastures and marshes.[b] Varies much in size, more frequently falling short of the dimensions given, (especially the males), the smaller individuals are also blacker and smoother.

Gen. II.—Læsthia. *Haliday.*

Caput oblongo quadratum, margine orali utrinque et fronte anticè mucronatis. Oculi minuti glabri. Antennæ infra mediam faciem insertæ remotæ, — feminæ 9-*articulatæ clavatæ,* — maris 10-*articulatæ ante apicem incrassatæ. Collare anticè attenuatum. Alæ fere nullæ. Abdomen subsessile ovatum depressum.*

Caput magnum anticè haud attenuatum, ore prominulo, margine supra mandibulas utrinque mucronato: frons leviter depressa carinulâ media elevatâ, inter antennas mucronatâ: ocelli 3 in triangulum positi, postici occipitales minutissimi, in ♀ inconspicui: antennæ — *feminæ* longitudine thoracis, scapo trientem longitudinem adequante, pedicello clavato longiore quam articulo 3^tio^. sequentibus subglobosis sensim crassioribus ultimo longè maximo ovato-acuminato; — *maris* paulo longiores pedicello minore, flagello sensim incrassato, articulis 9mo. 10mo. rursus angustioribus arctè connatis, 10mo. longiore apice attenuato: mandibulæ breves subquadratæ apice inæqualiter denticulatæ: labrum et maxillæ fere quales *Spalangiæ:* palpi labiales biarticulati, articulo 1mo. clavato, 2do. utrinque attenuato—maxillares longiores conformes: thorax oblongus capite longior et angustior: collare crateriforme antice attenuatum: mesothorax quadratus, scuto transverso humeris minutissimis, scutello transverso subquadrato, parapteris minutissimis valde remotis: alæ scutello haud longiores decumbentes coriaceæ: metathorax brevis constrictus: abdomen thorace longius et latius, (præsertim in ♀,) ovatum subdepressum, aculeo exerto brevi subconico parum compresso: pedes quam in *Spalangiâ* breviores (haud saltatorii?); coxæ et femora

[b] "In excrementis humanis."—*Spinola.*

lata compressa: tarsi tibiis vix breviores articulis 1mo.—4um. longitudine decrescentibus, metatarso antico haud dilatato.

The wings being reduced to rudiments, the parts of the thorax connected with these organs are very minute in this genus. It is nearly allied to *Spalangia*, and with it may be considered as forming a typical group,[c] from which *Pirene* recedes by its peculiar trophi and compressed aculeus.

Sp. 1. L. vespertina. *Luteo testacea dorso æneo micans oculis et antennis apice fuscis.* ♀ ♂ (Long. ♀ .1.)

Spalangia vespertina.—*Curt. G.*

Vertex atque mesothoracis et abdominis dorsum obscuriora et æneo-micantia: pedes pallidiores.

On midsummer evenings I have twice taken females of this singular little insect, wandering over the leaves of a book which I was reading. Another time I found one lurking among the florets of *Taraxacum*, as if for shelter from the mid-day sun. The only male I have met with was drowned in a basin of water.

Gen. III. Pirene.—*Haliday.*

Caput ovatum, ore prominulo, fronte canaliculatâ. Oculi magni. Antennæ versus os insertæ, breves, 10-articulatæ, clava magna ovata 3-annulata. Collare transversum. Abdomen subsessile compressum.

Ocelli tres, in triangulum positi, postici occipitales minuti: oculi magni ovati pubescentes: frontis canalicula profunda in verticem fere elongata, antrorsum bifurca: antennæ capite longiores, scapo elongato lineari aut dilatato, pedicello crasso clavato, articulis flagelli inferioribus brevissimis, ultimis 3 clavam latam ovatam constituentibus: labrum membranaceum, transversum rotundatum, subtiliter ciliatum: mandibulæ oblongæ apice latæ acutè 4-dentatæ: mentum obconicum, labium elongato-conicum tenue—palpi minutissimi punctiformes, fere obsoleti: maxilla lata compressa, lobo trigono attenuato, dorso incrassato indistinctè

[c] Though I have not seen the genus *Theocolax* (Westwood), I have little doubt that it is to be referred to this tribe, and very near the present. The club of the antennæ, in that 3-jointed, is here solid; but from analogy and a comparison of the male it must be considered to represent three joints, which might perhaps be separated by maceration. The face in that genus is described as unarmed; in this there are three sharp points.

articulato—: palpi lobo longiores articulo secundo longiore et graciliore :[d] thorax latitudine capitis et fere duplo longior, ovatus subdepressus: collare transversum: mesothoracis paraptera remota minuta humeris arctè annexa: scutellum ovatum basi truncatum, lineolâ transversâ (ordinariâ) subtilissimâ bipartitum, cum scuto metathoracis continuum: metathorax brevis declivis scuto lineari arcuato, scutello lævi: abdomen subsessile compressum, thorace angustius;—*maris* dorso elevatum carinatum, apice truncatum;—*feminæ* dorso nonnihil deplanatum aculeo compresso exerto: pedes quam in *Spalangiâ* breviores: tarsi tibiis parum breviores articulis a 1mo. in 4^m^. longitudine decrescentibus, metatarso antico haud dilatato: alæ anticæ apice valde rotundatæ, cubito brevissimo, radio ad ejus basin statim evanescente: posticæ angustiores quam in *Spalangiâ*.

This genus has less of the peculiar habit of its tribe than the others. On a cursory view it might be referred to the *Eulophi*, with which it agrees tolerably well in the wings and thorax; but a closer examination will shew its near accordance with *Spalangiâ*. A few of the *Pteromali* approach it by a compressed abdomen and the low insertion of the antennæ; such is *Macroglenes* (Westwood), and still more an unpublished subgenus in my cabinet. The males of *P. varicornis* so much resemble certain *Eulophi* with similar antennæ, (Genus *Ceranisus*, Walker) that they might, without examination, be confounded in one group.

Sp. 1. P. varicornis. *Antennarum articulis* 3°.—7^m^. *brevissimis latitudine sensim crescentibus, maris scapo dilatato; feminæ aculeo brevi.* (Long. corp. et aculei .08; alar. .12).

Pirene varicornis. *Curtis G.*

Nigra nitida: capite thoraceque viridi- abdomine chalybeo-micantibus: mandibulæ ferrugineæ: antennæ feminæ scapo lineari, clavâ magnâ ovatâ abruptâ;—*maris* scapo dilatato ovato, articulis flagelli inferioribus crassioribus et clavâ oblongâ minore quam in illa: abdomen *feminæ* lanceolatum, capite cum thorace longius, aculeo fere quadrantem longitudinem abdominis æquante: genua et tarsi fusco-pallidi, hi apice obscuriores, (tibiæ anticæ nonnunquam totæ posteriores basi et apice pallidæ,) alæ obscure hyalinæ, angustiores quam in reliquis, ulnâ longiore, cubiti apice vix dilatato.

[d] Sp. examined—*P. varicornis.*

The female is commonly to be found on the flowering panicles of *Anthoxanthum;* the male is very rare.

Sp. 2. P. chalybea. *Antennarum articulis* 3°.—6um. *sensim crescentibus* .7mo. *abrupte majore; feminæ aculeo brevi.* (Long. corp. et acul. .08; alar. .13.)

Pirene chalybea. *Curtis, G.*

Præcedenti concolor, fronte ænea: statura hujus vero crassior: antennæ nonnihil longiores, scapo in utroque sexu lineari, articulis 3°.—6um. transversis, in ♀ brevioribus, sensim crescentibus, 7mo. illis majore sed 8um haud adequante: abdomen *maris* ut in præcedente; —*feminæ* brevius, oblongum dorso magis deplanatum, aculeo crasso vix sextantem abdominis longitudinem attingente: pedes paulo crassiores: alæ candido-hyalinæ, cubiti apice in punctum dilatato.

Not uncommon upon the boughs of larch trees and the flowers of *Senecio Jacobea,* late in the summer.

Sp. 3. P. eximia. *Antennarum articulis* 3°.—6^{m}. *sensim crescentibus,* 7mo. *abrupte majore aculeo elongato.* ♀ (Long. corp. et acul. .1; alar. .12.)

Feminæ præcedenti simillima: antennæ nonnihil longiores: abdomen etiam longius, aculeo graciliore ejus dimidiam longitudinem superante.

Sp. 4. P. graminea. *Antennarum articulis* 3°.—6^{m}. *minutissimis,* 7mo. *maximo; aculeo brevissimo* Femina. (Long. .06; alar. .1.)

Præcedentibus minor brevior, nigra nitida chalybeo micans, tarsis fusco-pallidis: pedes quam in illis graciliores: antennæ breviores articulo 7mo. vix minore quam 8vo: abdomen *feminæ* vix thoracis longitudine, ovatum compressum, aculeo brevissimo: alæ hyalinæ nervis tenuissimis, cubiti apice dilatato.

On grass in summer; but rare.

Trib. 3^{tia}.—Eulophi.

Tarsi tetrameri. Palpi biarticulati subconici.

Or the genus *Entedon* of Dalman, excluding *Aphelinus;* but his generic character is too exclusive, as the aculeus is exserted in several, and the number of joints in the antennæ varies up to eleven.

Subgen.—Omphale. *Haliday.*

Antennæ 7-articulatæ, flagello — maris *elongato lineari, verticillato-piloso, articulis æqualibus;* — feminæ *filiformi articulis apicis longitudine decrescentibus ultimo minuto acuminato. Alæ anticæ cubito brevissimo radio statim abrupto. Abdomen subsessile* maris *oblongum;*—feminæ *acuminatum rimâ ventrali in basin fere elongatâ, aculei apice exerto.*

Vertex linearis, frons latè impressa: antennæ *feminæ* scapo lineari, pedicello clavato, breviore quam articulo 3°. reliquis longitudine decrescentibus discretis ultimo minuto acuminato;—*maris* scapo dilatato, pedicello brevissimo, flagello elongato lineari compresso, articulis singulis apice attenuatis: trophi fere quales subgeneri *Eulopho sc.* mandibula lata trigona apice tridens: mentum subcompressum, labium plicatum apice attenuatum incisum: palpi articulis subequalibus, 2do. apice attenuato: maxilla lata compressa, lobo attenuato-trigono intus membranaceo dorso firmiore indistinctè articulato: palpi labialibus conformes parum longiores:[e] thorax ovatus: collare brevissimum: mesothoracis paraptera remota minuta humeris arctè annexa, scutellum rotundatum leniter convexum, lineolâ transversâ subtilissimâ vel obsoletâ: metathorax brevis declivis: abdomen thorace angustius subsessile segmenti primi puncto petiolari membranaceo incisum;—*maris* lineare obtusum thorace parum longius; — *feminæ* dimidio-triplo longius, lanceolatum dorso deplanatum, ventre carinatum, usque sub segmentum dorsale 2um. rimâ ventrali fissum: aculeus longus apice et valvulis breviter exertis: alæ anticæ ulnâ elongatâ, radio ultra basin cubiti brevissimi vix producto: posticæ ulnâ tenui duplicatâ: pedes graciles.

From Eucercus *(Walker)*, which it somewhat resembles, it may be distinguished by the antennæ, being but 7-jointed, not clavate in the female, with the joints after the pedicel of equal length in the male; by the less convex scutel without longitudinal lines, the shorter aculeus and the cubital nervure shorter and nearer the tip of the wing.

Sp. 1. O. salicis. *Viridi-aurea alis candido-hyalinis, antennarum scapo basi flavo, pedibus luteo fuscoque variis ♂ ♀ : abdomine medio atro purpureo ♂ : aut fasciis atro*

[e] Sp. examined—*O. salicis.*

purpureis segmento ultimo longissimo ♀. (Long. ♂. .8; ♀. .12; alar. .17.)

Omphale salicis.—*Curt. G.*

Abdomen feminæ thorace triplo longius segmento ultimo trientem longitudinem occupante; punctum petiolare pallidum: pedes quam in reliquis longiores valde graciles; coxæ virides, trochanteres, apex femorum, tibiæ et tarsi lutei, illæ medio hi apice obscuriores: alarum nervi dilutè fusci.

This brilliant species is found on willows (S. Helix et vitellina); the females are fond of basking in umbelliferous flowers in strong sunshine. Among the remaining species none of the females have the last segment so conspicuously elongated as the present, which I regard as the type.

Trib. 4ta. ——?

Tarsi trimeri. —— ——?

GEN. I.—CALLEPTILES. *Haliday.*

Antennæ flagello lato compresso piloso haud distinctè clavato. Alæ anticæ latissimæ setulis microscopicis seriatim ordinatis, nervo subcostali brevi lato sigmoideo. —— ——?

Caput transversum, vertice lineari; oculis parvis rotundis distantibus: ocellis 3 in triangulum: fronte latâ impressâ: antennæ infra mediam faciem insertæ, longitudine thoracis, scapo oblongo, pedicello clavato, annello unico[f] minutissimo, flagello scapo paulo longiore, lato compresso pilosissimo articulis contiguis parum distinctis (7?), ultimis tribus arctius connatis: thorax breviter ovatus, convexus, collari brevissimo; mesothoracis humeris discretis, parapteris remotis subovatis, scutello brevi rotundato convexo; metathoracis scuto discreto lunato, scutello leviter canaliculato: abdomen longitudine thoracis, sessile obtusè-trigonum dorso deplanatum: pedes breviusculi, tarsis trimeris articulis subequalibus: alæ anticæ extrorsum latissimæ apice rotundatæ; nervus subcostalis dilatatus bisinuatas sinu antico costam modo contingens, dehinc in discum inflexus, apice bifurcus, vix trientem alæ longitudinem accedens; lineola setigera exinde fere trans alam ducta aream baseos glabram cingit; setulæ reliquæ alarum dispositæ sunt in lineas ex hâc areâ radiatim excurrentes in marginem

[f] The joints of the antennæ following the pedicel are sometimes abruptly smaller than the rest, and commonly overlooked in the computation of the joints. It is to such that I apply the distinctive epithet *annelli*.

exteriorem subtiliter ciliatum: alæ posticæ lineares angustissimæ ciliatæ, nervo subcostali brevissimo tenui.

Sp. 1. C. latipennis. *Nitide fuscus alis hyalinis antennis ore pedibus abdominisque basi lutescentibus* ♂. (Long. .025; alar. .07.)

Microma latipennis . . . *Curt. G.*

[Trichogramma evanescens. *Westwood. Lond. & Edinb. Phil. Mag.* Third Series. Vol. II. No. XII. p. 444?—Ed.]

Caput subtus et antennæ obscure lutescentes; abdomen antice pedesque pallidiores; vertex et thorax fusca nitida; oculi rubri: alæ hyalinæ radice obscuriores, nervo subcostali fusco.

Bred from subcutaneous larvæ in the leaves of Aquilegia: J. Curtis, to whom I owe the species.

The trimerous tarsi, and peculiar wings, so decidedly separate this insect from the preceding tribes, that I could not satisfy myself of its affinity to any one of them; and have therefore preferred the confession of ignorance, implied in the leaving it as an insulated species. Where there is such marked disparity of typical characters, I am inclined to distrust slighter resemblances, or I might have supposed a relation to the *Eulophi*. The trophi would probably determine the point, but I have not attempted their investigation, as Mr. Curtis possesses only one complete specimen besides the one he most liberally gave to me.

Trib. 5ta.—Mymares.[g]

Caput transversum areolatum. Antennæ supra mediam faciem insertæ, graciles elongatæ fractæ, feminis capitatæ. Os epalpatum. Alæ angustæ ciliatæ, nervo subcostali brevissimo, cubitali nullo.

Areolarum capitis hæc est circumscriptio: vertex anticè et utrinque lineolis elevatis terminatur lateralibus posticè inflexis aut cum margine præciso occipitis coeuntibus: frons pari modo secernitur

[g] Or the genus Mymar, E. B.; the genera here distinguished being disposed under it as subgenera. For an arrangement founded on other details, see Mr. Walker's divisions given in E. B. I suppose Genus 189 (unnamed) of Stephens's Catalogue also to be equivalent to my tribe, and his Platygaster ovulorum not to be the species for which I have cited Ichn. ovulorum, L.—otherwise that indication is determined by its representative, Ichn. punctum (*Shaw*) to the subgenus Anaphes.

a regione oculorum, lineolâ aliâ insuper sub antennas arcuatim ductâ. Quo vero crassius caput est et vertex planior eo magis emicat hæc structura: nonnullis quorum caput brevissimum est (e.g. *Anagro*) vertex antrorsum declivis fere in lineæ speciem contractus et antennæ inferiùs insertæ videntur: antennarum radicula sæpe exserta tenuis, capitulum *feminarum* plerunque exannulatum, rarius biarticulatum (Eustocho): mandibulæ trigonæ apice denticulis 3: maxillæ unâ cum labio ovato-circumscriptæ: palpi desunt:[h] thoracis forma variat: mesothoracis lobi humerales discreti; paraptera minuta valde remota; scutellum subtiliter transversè bipartitum, plerisque cum scuto metathoracis continuum: alæ valde angustæ lineares vel anticæ obovatæ nunquam trigonæ: nervus subcostalis tenuis quadrantem alæ longitudinem vix attengit sæpius adhuc multo brevior, radio et cubito nullis, ulnâ lineari brevi, vel etiam in punctum contracta: alarum margo plerisque pulchrè ciliatus *s.* plumatus: abdomen sæpius ad instar Cynipedum tereti-compressum, segmentorum dorsalium marginibus inflexis ventrem obtegentibus: venter carinatus arcuatim ascendens: aculeus gracilis crimæ ventrali repositus: pedes elongati graciles saltatorii, tarsis pentameris aut tetrameris.

This tribe comprises the very atoms of the order Hymenoptera. Their hues are mostly black or yellowish, unadorned by metallic splendour: the plumed and iridescent wings of many are beautiful objects for the microscope. The males, by their very long and slender antennæ, (sometimes more than twice the length of the body,) resemble Ichneumons in miniature. The females oviposit in the eggs of other insects, from which the tiny parasite emerges only in the perfect state, a single butterfly's-egg often nourishing the transformation of many individuals. The species occur from the earliest spring upon the herbage of groves and meadows, walking and leaping; most copiously on warm still days of autumn, when a host of *Lepidoptera*, &c. are engaged in laying the latest brood of eggs to be hatched the following spring. With regard to their position in the system, both Stephens and Curtis refer them to the *Proctotrupidæ;* and such high authority makes me very diffident in proposing for them a position nearer to the *Chal-*

[h] Species examined,—*Ooctonus insignis*, *O. vulgatus*, *O. litoralis*, *Polynema ovulorum*. In a living specimen of *Polynema ovulorum*, I have seen at the back of the maxilla, in the ordinary place of the palpus, a minute shapeless tubercle, which becomes contracted, and disappears in dried specimens.

cides:[i] to which I have been determined principally by an examination of the parts of the thorax,[k] and the position of the petiole, which however presents a marked peculiarity.[l]

Gen. I.—Ooctonus. *Haliday.*

Antennæ maris 13-*articulatæ, feminæ* 11-*articulatæ capitulo exannulato. Tarsi pentameri.*

A. *Abdomine petiolato.*

His statura *Polynemæ* fere, sed brevior abdomine magis rotundato, pedibus brevioribus, alis breviter ciliatis, ulnâ brevi lineari: quoad reliqua, caput thorax abdomen alæque satis conveniunt: antennæ *feminæ* scapo elongato utrinque attenuato, pedicello lato compresso, articulis flagelli longitudine subæqualibus aut intermediis longioribus, exterioribus sensim incrassatis; undecimus major ovatus *s.* oblongus;—*maris* articulis flagelli linearibus subequalibus.

[i] I do not mean to venture an opinion, that the aggregate group is co-ordinate with those which rank as families in the rest of this order. Till the contents of the *Pupivora* are more fully investigated, the value of its sections must remain exposed to doubt. When the natural groups shall have been recognized and examined in detail, we may hope that some systematist of comprehensive mind and adequate knowledge will assign them respectively to their proper grade, perhaps a higher than is yet conceded to them. The *Chalcides* and *Oxyuri* seem each to embrace more than one equivalent to such families as the *Ichneumones, Chrysides, and Gallicolæ.* As to the *Fænidæ*, the chain is so interrupted from the small number of genera, that it might be rash to divide it. The family besides is, in its present form, far too convenient a receptacle for all stray articles to be lightly resigned. I am obliged to enrich it further at the expense of the *Ichneumones* with two genera—*Stephanus* and *Plancus*—which *Pelecinus* and *Fænus* seem respectively to reclaim; of the latter I am more doubtful; for the other I have the authority of Jurine and Spinola.

[k] Important as the structure of the aculeus is to the functions of these Hymenoptera, its variations are to be admitted with great caution into the characters of the higher groups, the more obvious differences often depending less on the typical composition than on its greater or less development in length. Parallel variations seem to be often reproduced in distinct families. Perhaps there is no one character which has been more generally fixed on to distinguish the *Gallicolæ* than the spiral aculeus, but in *Anacharis nitidula, Dalm.* there is nothing to claim such an epithet κατ' ἐξοχήν; the aculeus is simply subulate, shorter than the last ventral segment in which it is contained, and it would demand a sharp sight to single out any palpable difference in its form from the same organ of *Cinetus gracilis.*

[l] It may be added, that there are certain resemblances between species of this tribe and the genus *Evania*, but so partial that I have not ventured to entertain any conjecture as to their significance or tendency.

Sp. 1. O. insignis. *Niger alis obscurè hyalinis, antennis basi pedibus et petiolo flavis* ♂ ♀ *; capitulo antennarum elliptico* ♀. (Long. .06; alar. .15.)

Polynemæ ovulorum valde similis: antennæ feminæ articulis a 3^tio^. in 10^m^. longitudine subequalibus, exterioribus sensim paulo crassioribus, 11mo. magno fere oblongo.

Taken near London.

Sp. 2. O. vulgatus. *Niger alis obscurè hyalinis, antennis basi pedibus et petiolo flavis* ♂ ♀ *; capitulo antennarum ovato* ♀. (Long. .04; alar. .1.)

Præcedenti similis at longè minor præsertim brevior; antennæ breviores basi obscuriùs flavescentes, ♀ flagello extus sensim incrassato, articulo 11mo. longe maximo ovato.

Very abundant on grass near trees.

Sp. 3. O. hemipterus. *Niger alis abbreviatis antennis basi pedibus et petiolo flavis capitulo antennarum ovato* ♀. (Long. .04.)

Præcedentis statura et magnitudo: antennæ paulo breviores et apice crassiores: alæ vix longitudine thoracis.

In the same places with the last, but rare.

B. *Abdomine subsessili.*

Discrepant hi ab *Oöctonis* sectionis 1^mæ^. capite oblatiore, vertice fere lineari; collari breviore; abdomine haud petiolato, infrà præsertim basi valde compresso: antennis *maris* brevioribus crassiusculis, *feminæ* capitulo angustiore.

Sp. 4. O. litoralis. *Piceo niger alis ceruleo-hyalinis, antennis basi et abdomine antice sulphureis pedibus concoloribus plus minus infuscatis* ♂ ♀. (Long. .04; alar. .11.)

Antennarum scapus et pedicellus lutescentes: abdomen posticè nigricans: pedes anticè sulphurei femorum basi fuscâ, postici vel concolores, vel fusci geniculis tantum luteis; etiam prothorax *maris* nonnunquam subtus lutescit.

Common on the sea-coast near Holywood.

Sp. 5. O. pictus. *Sulphureus alis subhyalinis, antennarum flagello capite thoracis maculis anoque nigricantibus* ♀. (Long. .033; alar. .09.)

Statura fere præcedentis: antennæ breviores crassiusculæ: collare, margo anticus scuti, punctum humerale utrinque et paraptera

fusca; scutellum fuscum lateribus flavum: metathorax cum postpectore nigro-fuscus: femora medio, tarsi apice obscuriores. Taken near London.

Gen. II.—Litus. *Haliday.*

Antennæ feminæ 9-*articulatæ capitulo exannulato. Tarsi pentameri.*

Characteres fusiores petendi sub singulis speciebus.

Sp. 1. L. cynipseus. *Niger capite thoraceque opacis, alis fuscis longè ciliatis, pedibus ferrugineis* ♀. (Long. .02; alar. .08.)

Caput et thorax granulato-opaca: frons lata truncata: vertex planus: occiput excavatum: antennæ *feminæ* radiculâ brevissima, scapo longiusculo arcuato utrinque attenuato, pedicello lato compresso, articulis flagelli 6 minutis, 3^{tio}. breviore, exterioribus sensim incrassatis subglobosis, ultimo 3 præcedentibus simul sumtis longiore, ovato-acuminato: thorax brevis gibbus: collari brevissimo arcuato; metathorace truncato: abdomen breve sessile metathoraci adpressum, tereti-compressum, ventre carinatum, aculei apice subexerto, (forma fere ut in genere *Cynipede*): alæ lineares anticæ paulo latiores undique longe ciliatæ: pedes approximati solito crassiores, tibiis anticis clavatis.

Not uncommon on grass near trees.

Sp. 2. L. dimidiatus. *Piceus ano concolore, alis lutescenti-hyalinis, antennis basi abdomine pedibusque luteis.* ♀. (Long. .04; alar. .08.)

Mymar dimidiatus. *Curt. G.—E. B.*

Huic omnia fere ut in *Oöctonis* sectionis B. modo antennæ 9-articulatæ et alæ angustiores sunt: caput oblatum vertice fere lineari, piceum ore lutescente: antennæ luteæ apice fuscescentes, articulis flagelli oblongis extres latitudine crescentibus, ultimo oblongo ovato vix duplo majore quam præcedente: thorax piceus scutello rufescente: abdomen subsessile compressum, luteum apice fuscum: pedes graciles lutei: alæ anticæ fere lineares breviter ciliatæ posticæ angustiores longius ciliatæ.

This and the preceding may be considered as the probable types of distinct genera, which I have thought it premature to separate without having examined a greater number of species.

Gen. III.—Anaphes. *Haliday.*

Antennæ maris 12-*articulatæ*, feminæ 9-*articulatæ capitulo exannulato. Tarsi tetrameri. Abdomen subsessile ovoideum.*

Caput oblatum vertice fere lineari: frons subimpressa: antennæ *feminæ* scapo compresso utrinque attenuato, pedecello lato compresso, articulo 3^tio^. brevissimo, reliquis subæqualibus latitudine crescentibus, ultimo magno oblongo; — *maris* flagello filiformi articulis subequalibus: thorax breviter ovatus convexus collari brevissimo, scutello ovato, metathorace rotundato: abdomen breve ovoideum subsessile aculeo vix exerto; alæ anticæ latiores, posticæ lineares longius ciliatæ.

Sp. 1. A. fuscipennis. *Niger alis fuscis, antennis basi et pedibus pallidè piceis.* ♂ ♀ (Long. .025; alar. .06.)

Perpusillus; antennæ crassiusculæ præsertim *maris*: alæ tenuiter ciliatæ.

The species of this genus are numerous; mostly black, with pitchy or rust-coloured legs, and obscure or hyaline wings: *Ichneumon Punctum*, Shaw (Linn. Trans. IV. Pl. 18, fig. 1.), is to be referred to it. In this species the wings are fringed with longer hairs than ordinary.

Gen. IV.—Anagrus. *Haliday.*

Antennæ maris 13-*articulatæ*, feminæ 9-*articulatæ capitulo exannulato. Tarsi tetrameri. Abdomen sessile conico-acuminatum.*

Caput valde oblatum vertice lineari, fronte depressâ: antennæ *feminæ* articulo 3^tio^. brevissimo, sequentibus subequalibus ultimo majore oblongo;—*maris* compressæ crassiusculæ articulis flagelli interioribus paulo brevioribus: thorax oblongus depressus, collari parvo attenuato, scutello brevi semiorbiculato; metathorace fere disjuncto, subitò depresso et dorso excavato: abdomen sessile metathoracis dorso incumbens, conicum elongatum, dorso deplanatum aut canaliculatum, ventre compressum carinatum, aculeo breviter exerto: pedes graciles: alæ lineares plumato-ciliatæ, anticæ apice nonnihil dilatatæ rotundatæ: cilia haud ex ipso margine oriuntur sed interiùs unde margo alæ pulcherrimè duplicatus *s.* striatus extat: nervus subcostalis tenuissimus.

Sp. 1. A. atomus. *Pallido fuscoque varius alis hyalinis.* ♀ (Long. .02; alar. .05.)

Ichneumon atomus. *Linn.*

Caput, antennarum apex, prothorax et anus sæpius subfusca: alæ limpidæ pulcherrimè ciliatæ.

Upon grass under trees, in autumn; common.

Sp. 2. A. incarnatus. *Ruber oculis nigris scutello pallido alis lutescenti hyalinis.* ♀ (Long. .03; alar. .07.)

Huic thorax minus elongatus quam præcedenti; alæ plumatæ quidem sed breviùs: antennæ basi et pedes dilutiores, aculeus fuscus.

Not rare in similar places with the last.

Sp. 3. A. ustulatus. *Fuscus antennis thoracis disco pedibusque ferrugineis, alis hyalinis.* ♂ (Long. .03; alar. .08.)

Præcedentibus brevior, colore obscuriore; alæ ut in *A. atomo.*

There appear to be other species of this genus with similar mingled shades of pale and dusky.

Gen. V.—Polynema. *Haliday.*

Antennæ maris 13-*articulatæ*, feminæ 9-*articulatæ capitulo exannulato, utriusque scapo dilatato sinuato parum elongato. Tarsi tetrameri. Abdomen petiolatum.*

Caput crassiusculum subrotundatum, vertex latè planiusculus: frons subtruncata: antennarum scapus capite vix longior dilatatus sinuatus, pedicellus latus compressus, flagellum *maris* lineare articulis exterioribus longitudine decrescentibus; — *feminæ* articulo 3^{tio}. breviore quam 4to. exterioribus sensim brevioribus et crassioribus, ultimo magno ovato: thorax ovatus convexus lævis collari conspicuo, scutello ovato, metathorace rotundato: abdomen petiolatum semicordatum aut fere lanceolatum ascendens, *feminæ* apice deplanatum aculeo brevi vel elongato: petiolus ut etiam sequentibus filiformis descendens: pedes longi graciles: alæ anticæ angustè obovatæ ciliatæ, nervo subcostali brevissimo clavato (*sc.* ulnâ fere in punctum contractâ); posticæ lineares longius ciliatæ.

Sp. 1. P. ovulorum. *Piceo niger alis obscurè hyalinis, antennis basi pedibus et petiolo flavis.* ♂ ♀ (Long. .07; alar. .16, vel minor.)

Ichneumon ovulorum. *L. S. N.—Fna. S.—Schra. F. B.* &c.
Cryptus ovulorum. . *Fabr. S. P.*
Mymar ovulorum . *Curt. G.*—E. B.
Platygaster ovulorum. *Steph. Cat.?* vix.

Antennæ *feminæ* articulo 3^tio^. longitudine 2^di^.: alæ hyalinæ, fusco-pilosæ et margine longiùs ciliatæ: aculeus subexertus: petiolus coxis posticis longior.—Variat collari utrinque rufescente.

Abundant in summer, destroying the eggs of Pontia Brassicæ, &c. Linné and Schrank have each described two species under this.

Sp. 2. P. pusillus. *Nigro-piceus alis obscurè hyalinis, antennis basi pedibus et petiolo flavis, antennarum articulo 3^tio^. brevissima* ♀ (Long. .04; alar. .08.)

Præcedenti similis at minor et brevior antennis pedibus et petiolo multo brevioribus: alæ minores angustiores parciùs pubescentes et ciliatæ.

Sp. 3. P. fuscipes. *Ater alis hyalinis, antennarum pedicello pedibus et petiolo ferrugineis.* ♂ ♀ (Long. .05+; alar. .14.)

Specie primâ robustior, petiolo et pedibus brevioribus; antennæ *feminæ* fere conformes, *maris* crassiores: femora basi, tarsi apice obscuriores; pedes posteriores sæpe fere toti fusci: alæ hyalinæ sublitissimè pubescentes, margine longius ciliatæ.

In similar situations less frequent.

Sp. 4. P. atratus. *Ater alis hyalinis, antennarum pedicello petiolo et pedibus ferrugineis, abdomine subgloboso* ♀ (Long. .045; alar. .1.)

Præcedenti simillimus, antennis et pedibus brevioribus, alis angustioribus parcè ciliatis; abdomine brevi subrotundato.

Sp. 5. P. euchariformis. *Ater alis hyalinis, pedibus piceis, antennarum pedicello et tarsis pallidis, aculeo elongato,* ♀ (Long. .06; alar. .1.)

Abdomen valde angustum dorso lanceolatum, aculeo parum longius: alæ tenuiter ciliatæ: petiolus fusco-ferrugineus: tarsi apice fusci: antennarum articuli 2^dus^. et 3us. longitudine pares ut in præcedentibus.

Not rare in similar situations.

Gen. VI.—Mymar. *Haliday.*

Antennæ maris 13-*articulatæ;* feminæ 9-*articulatæ capitulo exannulato, scapo utriusque elongato lineari. Tarsi tetrameri. Abdomen petiolatum.*

Caput oblato-globosum, vertice latè planiusculo subquadrato, fronte producta obliquè truncata: antennæ elongatæ, *feminæ* scapo longissimo lineari, pedicello lato compresso, articulis 3°. 5°. 6°. 7°. et 8°. brevibus, his sensim crassioribus, 4to. lineari vix breviore quam scapo, ultimo magno elliptico: *maris* adhuc multo longiores scapo lineari arcuato, flagelli articulis exterioribus parum brevioribus: thorax fere ut in *Polynemâ*, collari adhuc majore: abdomen petiolatum semicordatum ascendens aculeo brevi: pedes gracillimi eximiè elongati: alæ anticæ valde elongatæ capillares, apice summo explanatæ, margine longius plumato ciliatæ, lineolâ disci setigerâ longitudinali unicâ: posticæ brevissimæ setaceæ nudæ.

Sp. 1. M. pulchellus. *Ochreus antennis apice oculisque fuscis, alis hyalinis apice nigris.* ♂ ♀ (Long. 06; alar. .12.)

Mymar pulchellus. *Curtis, E. B.* 411.
Presented to me by Mr. Walker.

Gen. VII.—Eustochus. *Haliday.*

Antennæ feminæ 10-*articulatæ capitulo bi-articulato. Tarsi tetrameri. Abdomen petiolatum.*

Caput transversum, occiput truncatum; vertex latus planus undique definitus transverso quadratus angulis anticis mucronatis; frons truncata: antennæ margini summo frontis insertæ, scapo longiusculo fusiformi, pedicello clavato, articulis sequentibus linearibus, 3^tio^. 4to. subequalibus, 6°. 7°. 8°. brevioribus incrassatis, 9no. et 10mo. capitulum magnum lenticulari-ovatum efformantibus: thorax breviter ovatus valde convexus, collari inconspicuo; mesothoracis scutello et metathoracis scuto continuis, per dorsum longitudinaliter elevatis, lateribus præcisis: abdomen petiolatum ascendens semicordatum teres apice acuminatum, aculeo elongato ascendente: alæ anticæ obovatæ longiùs ciliatæ, ulnâ quam in reliquis generibus magis elongatâ; posticæ lineares ciliatæ: (*plura videas sub specie unicâ.*)

Sp. 1. E. atripennis. *Niger capite thoraceque opacis, alis fuliginosis, antennis basi pedibus et petiolo ferrugineis.* ♀ (Long. corp et acul. .07; alar. .11.)

Mymar atripennis. *Curtis, E. B.*

Caput thorax et coxæ posticæ granulatæ: abdomen lævissimum nitidum: aculeus abdomine longior: alæ pilosæ lineolâ ambiente crassiusculâ: lunula seu fascia ferruginea internè hylalino limbata sita est transversè prope basin alarum anticarum fere sub medio ulnæ, lineola tenuis subimpressa (*s.* nervus spurius) ibidem orta usque in marginem exteriorem pone apicem alæ excurrit, leni flexu a costâ discedens.

In autumn, among trees, but very rare.

Add.—Of the other genera indicated in this family, *Crantor* is *Choreia*, Westwood; I had considered *Encyrtus ineptus*, Dalman, as the type; *Choreia nigro-ænea*, Westw., seems to approach the genuine *Encyrti;* some of which have little more than rudiments of wings. The identity of *Agonioneurus*, Westwood, with *Aphelinus*, has been already pointed out, (antea page 306). I have deferred giving the characters of the genus *Cea*, (Curt. G. 587,) with the hope of having the opinion of a more competent judge than myself upon its affinities.

Art. XXXIX.—*Observations on Ignis Fatuus.* By George Wailes, Esq.

I think the surmises of the writer in the Westminster Review, that this natural phenomenon is to be attributed to some luminous insect, are, so far as Britain and northern climes are concerned, without foundation. That any large insect, possessing the property of luminousness, should have hitherto escaped the pursuit of not only the Entomologists of this island, but our numerous and indefatigable brethren on the continent, is, to say the least, very improbable. Our only British *Annulosa* which have the power of hanging out their lights are the glow-worm (*Lampyris noctiluca*, Linn.), and *Scolopendra electrica*, De Geer. Although Mr. Dilwynn, in his valuable Memoranda relating to Coleopterous insects found in the neighbourhood of Swansea, states, "Nor have I here observed the *small* light in the males," of the glow-worm,

" which is always sufficiently obvious near Dover," no Entomologist requires to be reminded that neither the Apterous female of this beetle, nor the equally wingless *Scolopendra*, can by any possibility perform the vagaries so identified with the very name of " Will-with-the-Wisp." No doubt, the insect alluded to by the Reviewer as having been brought to light by the pond-side is meant for the mole cricket, but I do not think, after the vague descriptions and consequent wild-goose-chases with which every Entomologist has been more or less pestered by his non-entomological friends, we ought to allow the surmises of the " Mudlark" to be entitled to much weight, nor yet the flying, fiery " dragon-fly" of the " subsequent examiner." You ask for facts—the following you may depend upon. I had often heard my father mention an ignis fatuus which he and a friend, " nunc inter beatos," saw several years ago, and the notice in your last number caused me to ask for full particulars. They were riding along the road between Hexham and Alston, in the month of May, accompanied by a servant; and in crossing the wild moors, near the place where the counties of Northumberland and Cumberland join, about ten o'clock P.M., were surprised by the sudden appearance of a light within fifteen yards of the roadside. It was about the size of the hand, and its shape, which was oval, very well defined. The light is described to me as more like that of a bright white cloud than of a flame. The place where it appeared was very wet, and the peat moss had been dug out, leaving what are locally termed " peat pots," which soon fill with water, affording nourishment to numerous *confervæ* and the various species of *Sphagnum*, which in their turn are metamorphosed into peat. Doubtless these places, during the decomposition of the vegetable matter, give out large quantities of gaseous particles. The light was about three feet from the surface of the ground, and, hovering over the peat pots, moved for the distance of about fifty yards nearly parallel with the road, and then, probably on the failure of the supply of gas, suddenly went out. In order to obviate the question, Was not this the alighting of the insect, supposing it to have been one? I inquired whether the light approached the ground on going out, and find that it did not, but the manner of its disappearance was similar to that of a candle being blown out.

This is the only authentic account I ever had from an eye-

witness who had been so very near to an ignis fatuus; but when at school, I recollect, from the bedrooms, we used frequently to observe lights at night in a very wet wood, distant about half a mile from the village. Sometimes two or three or even more were seen at one time, and they appeared to wander up and down about the marsh. It may be urged they probably were tallow *ignes fatui;* but the wood, of nutting notoriety, was too well known to us from its swampy character to be at all inviting for a walk by candle-light, and, besides, the vagaries of the flames forbid our attributing them to human agency. So well known was the phenomenon, that it was no uncommon amusement to rise from our beds and watch the Will-with-the-Wisps. However as we were not permitted to go by night in search of "Jack-o'-lantern" adventures, these observations must necessarily be received with some degree of caution. In short, I think there can be no doubt but that the *moving* (if I may be allowed to use the term) *ignis fatuus* of this country always owes its origin to the spontaneous ignition of gaseous particles, arising, in most instances at least, from the decomposition of vegetable matter, and which, when ignited, is put in motion by any current of air; whilst the *stationary* one may arise from the same cause or the presence of either the glow-worm or *Scolopendra.* I do not remember ever to have heard or read of any of these lights having been seen about the floating island which now and then shews itself in Derwentwater lake; but I think it is more than probable that such things do occur, considering the immense quantity of gas which escapes, which I have myself witnessed when an oar or stick is thrust through the matted surface of vegetable matter forming the crust of the island.

The most detailed and satisfactory account of the *ignis fatuus* I have been able to meet with, is contained in a highly interesting paper in the number of Professor Jameson's Edinburgh New Philosophical Journal for January last, entitled, "*Observations on the Ignis Fatuus or Will-with-the-Wisp, Falling Stars, and Thunder Storms, by L. Blesson, Major of Engineers, Berlin,*" which I think sets the question quite at rest, and indubitably proves the gaseous origin of that appearance. As the book is perhaps not generally within the reach of your readers, I subjoin a copy of that portion of the paper relating to the *ignis fatuus;* and though the subject is rather without

the pale of your Magazine,[a] I am quite certain that the whole, or any part you may think proper to reprint, will be read with pleasure by every true lover of nature, be he meteorologist or not.

GEORGE WAILES.

P.S. M. Blesson's account of a thunder-storm he encountered on a mountain near Teschen, is the most extraordinary I ever read.

Observations on the Ignis Fatuus, or Will-with-the-Wisp, Falling Stars, and Thunder Storms. By L. BLESSON, Major of Engineers, Berlin.

THE first time I saw the Ignis Fatuus, or Will-with-the-Wisp, was in a valley in the Forest of Gorbitz, in the Neumark. This valley cuts deeply in compact loam, and is marshy on its lower part. The water of the marsh is ferruginous, and covered with an iridescent crust. During the day bubbles of air were seen rising from it, and in the night blue flames were observed shooting from and playing over its surface. As I suspected that there was some connexion between these flames and the bubbles of air, I marked during the day-time the place where the latter rose up most abundantly, and repaired thither during the night; to my great joy I actually observed bluish-purple flames, and did not hesitate to approach them. On reaching the spot they retired, and I pursued them in vain; all attempts to examine them closely were ineffectual. Some days of very rainy weather prevented further investigation, but afforded leisure for reflecting on their nature. I conjectured that the motion of the air, on my approaching the spot, forced forward the burning gas; and remarked, that the flame burned darker, when it was blown aside; hence I concluded that a continuous thin stream of inflammable air was formed by these bubbles, which, once inflamed, continued to burn—but which, owing to the paleness of the light of the flame, could not be observed during the day.

On another day, in the twilight, I went again to the place, where I awaited the approach of night: the flames became gradually visible, but redder than formerly, thus shewing that they burnt also during the day: I approached nearer, and they retired. Convinced that they would return again to the place of their origin, when

[a] Whilst a doubt exists on this interesting subject it is certainly a very appropriate one for our pages, and we confess that doubt does still exist in our own mind.—ED.

the agitation of the air ceased, I remained stationary and motionless, and observed them again gradually approach. As I could easily reach them, it occurred to me to attempt to light paper by means of them, but for some time I did not succeed in this experiment, which I found was owing to my breathing. I therefore held my face from the flame, and also interposed a piece of cloth as a screen; on doing which I was able to singe paper, which became brown-coloured, and covered with viscous moisture. I next used a narrow slip of paper, and enjoyed the pleasure of seeing it take fire. The gas was evidently inflammable, and not a phosphorescent luminous one, as some have maintained. But how do these lights originate? After some reflection I resolved to make the experiment of extinguishing them. I followed the flame; I brought it so far from the marsh, that probably the thread of connexion, if I may so express myself, was broken, and it was extinguished. But scarcely a few minutes had elapsed, when it was again renewed at its source (over the air-bubbles), without my being able to observe any transition from the neighbouring flames, many of which were burning in the valley. I repeated the experiment frequently, and always with success. The dawn approached, and the flames, which to me appeared to approach nearer to the earth, gradually disappeared.

On the following evening I went to the spot, and kindled a fire on the side of the valley, in order to have an opportunity of trying to inflame the gas. As on the evening before, I first extinguished the flame, and then hastened with a torch to the spot from whence the gas bubbled up, when instantaneously a kind of explosion was heard, and a red light was seen over eight or nine square feet of the surface of the marsh, which diminished to a small blue flame, from two and a half to three feet in height, that continued to burn with an unsteady motion. It was, therefore, no longer doubtful that this ignis fatuus was caused by the evolution of inflammable gas from the marsh.

In the year 1811, I was at Malapane, in Upper Silesia, and passed several nights in the forest, because ignes fatui were observed there. I succeeded in extinguishing and inflaming the gas, but could not inflame paper or thin shavings of wood with it. In the course of the same year I repeated my experiments in the Kouski in Poland. The flame was darker coloured than usual, but I was not able to inflame either paper or wood-shavings with it; on the contrary, their surface became speedily covered with a viscous moisture.

In the year 1812, I spent half a night in the Rubenzahl Garden, on the ridge of the Riesengebirge, close on the Schneekoppe, which

constantly exhibits the Will-with-the-Wisp, but having a very pale colour. The flame appeared and disappeared, but was so mobile that I could never approach sufficiently near to enable me to set fire to any thing with it.

In the course of the same year I visited a place at Walkenried, in the Hartz, where these lights are said always to occur; they were very much like those of the Neumark, and I collected some of the gas in a flask. On the day after, I found by experiment that it occasioned cloudiness in lime-water, a proof of its containing carbonic acid.

I observed accidentally another phenomenon allied to this, at the Porta Westphalica, near Minden. On the 3d August, 1814, we played off a fire-work from the summit, to which we had ascended during the dark, and where no ignis fatuus was visible. But scarcely had we fired off the first rocket, when a number of small red flames were observed around us, below the summit, which, however, speedily extinguished—to be succeeded by others on the firing of the next rocket.

These facts induced me to separate the ignes fatui from the luminous meteors, and to free them from all connexion with electricity. They are of a chemical nature, and become inflamed on coming in contact with the atmosphere, owing to the nature of their constitution.

I think it highly probable that the fires that sometimes break out in forests are caused by these lights.

Art. XL.—*Observations on the Influence of Locality, Time of Appearance, &c. on Species and Varieties of Butterflies.*

By. J. C. Dale, Esq. M.A. F.L.S., &c.

Papilio Machaon, though an abundant insect in some places, varies but little except in size; it has not been seen at Glanville's Wootton since the year 1818.

Colias Hyale has occasionally a white female, and also a variety with the black border broader. *C. Edusa* varies very much in size and colour, the variety of the female which

Haworth has called *Helice* being white; and there are two or three intermediate varieties in the British Museum, some very small, the *Chrysotheme* of Stephens.

Pontia Daplidice is much more brilliant in colour towards the south of France than in England or Sweden: climate has certainly an influence on this insect. *P. Cardamines* varies in size greatly, and in the black spot on the upper wings; it sometimes has a black spot on the second wings: Mr. Haworth has a specimen of this insect apparently hermophrodite. *P. Brassicæ* varies in size and markings according to the broods; the *P. Chariclea* of Stephens is a mere variety; a variety of *P. Rapæ* is in like manner the *P. Metra* of Stephens, but in this species there are more broods, and consequently more varieties. *P. Napi* varies still more, and if *P. napææ* and *P. sabellicæ* of Stephens are distinct, there are at least two more distinct species.

Hipparchia Janira is sometimes entirely cream-coloured, and I have a specimen spotted with that colour. *P. Tithonus* has occasionally an extra spot or two. *P. Hyperanthus* has sometimes very large ocelli, sometimes only white specks, and is sometimes immaculate. *P. Davus* occurs sometimes with very large ocelli, and I have taken one at Manchester with very small ones. *P. Polydama* occurs at Lake Bala. There is a variety of *P. Typhon* quite immaculate, it is called *Laidion;* and I have a specimen from Keswick with ocelli as large as any *Davus*. *Davus*, *Polydama*, and *Typhon*, are all exceedingly subject to vary, and I have no doubt that they will all prove to be but a single species. I have two specimens of *P. Pamphilus* quite immaculate on the upper side.

Vanessa Antiopa varies in the colour of the margins of its wings according to locality, being sometimes white and sometimes yellow. *V. C. Album* was formerly very common here. In the specimens of the June brood, the under surface of the wings is yellow; in those of the autumnal brood, brown; they seem to me very distinct, and yet they remain undivided.

Argynnis Paphia. I took a female nearly all black on the upper side; it is in the British Museum. Of *Ar. Aglaia* I have taken the variety called *Charlotta,* and the one figured by Mr. Curtis. *A. Adippe* I have found in larva in the New Forest. *A. Lathonia* has two broods. I have not observed that they vary.

Melitæa Euphrosyne. Of this insect the spring brood varies very much in markings, I have one specimen nearly white; the September brood varies in colour, it is much yellower. *M. Selene* varies in the same manner. The Rev. Mr. Bird has a specimen nearly black. *M. Cinxia* varies but little in colour; in markings only and size; sometimes the ocelli want the pupil. A variety of *M. Artemis* has been taken at Enbourne and in Wales: this insect was not seen at Glanville's Wootten from 1815 to 1822, and then it reappeared in great abundance. *M. Athalia* is very variable: *Eos, cunigera, tessellata,* &c. are varieties of this species.

Thecla quercus sometimes wants the black spot in the red anal spot. *T. W. album* varies more or less in the red anal spot. *T. rubi* has sometimes a row of white spots on the green side, and is sometimes entirely without them.

Of *Lycæna Phlæas* there are two or three broods; some of the varieties have blue spots on the lower wings; others vary in having the border of the upper wings narrow or broad, and some have the under wings totally black. In the fine autumn of 1826, I took one with the red border in the second wings quite interrupted. *L. dispar* varies only in the size and form, and the intensity of colour.

Polyommatus Arion varies in having the black spots large or small; the latter variety is called *Alcon.* The female of *P. Corydon* is sometimes nearly as blue as the male, and sometimes the ocelli on the under side are very nearly obliterated; sometimes they are large and elongated. *P. Adonis* varies in a similar manner: it has two broods. *P. Dorylas, Icarius, Alexis,* and *Eros,* are but a single species, varying amazingly in colour, markings, &c. I took a very fine female, allied to *Burrelii* of Haworth, being white underneath, and wanting the elongate spot. The female of *P. Argus* varies in being more or less blue, and sometimes very much larger, and has elongate spots on the underside. *P. Salmacis* or *Titus?* is intermediate between *Agestis* and *Artaxerxes;* in Scotland none of the *Agestis* are to be found, they are all *Artaxerxes;* in the south none of the *Artaxerxes* are to be found, they are all *Agestis.* At Newcastle they appear to be mules or hybrids, between the two species, partaking in some degree of the characters of both; some of the varieties have a black spot inside the white one, on the upper surface of the first wings.

Hesperia Alveolus and *H. Lataveræ* vary in having more or less white on the upper surface of the first wings. *H. Lataveræ* has the most.

Additional Notes on Butterflies.

Papilio Podalirius. I have a specimen of this insect, which I consider undoubtedly British; I received it with Dr. Abbot's collection; it was taken near Bedford. I certainly saw another specimen in Cambridgeshire.

Doritis Apollo. I have reason to expect that I shall obtain British specimens of this insect next season.

Pontia Daplidice. I received one from Dr. Abbott.

Vanessa Huntera. The Welsh specimen of this insect is much smaller than the American ones, and I rather doubt whether they are exactly the same species.

Apatura Iris and *Limenitis Camilla* have been found near Cranbourne.

Argynnis Niobe. Dr. Abbott considered *Niobe* to be nothing more than a variety of *Ar. Adippe;* in his MSS. he observes that the silver spots have sometimes yellow spots in them, and Stewart mentions the reverse of *A. Niobe.*

Melitæa Dia. I think that the specimens taken at Sutton Park, by Mr. Weaver, of Birmingham, are most probably this species.

Melitæa. I found the young larvæ of a *Melitæa* at Lulworth in August. I think they were most probably those of *M. Cinxia.*

Lycæna Chryseis. I received one from Dr. Abbott.

Thecla Betulæ is mostly bred from the larva by Captain Blomer now; I used to take it in great plenty, but have not seen it for years.

Colias Europome. I have male and female from Russia; it is very distinct from *Philodice,* which I had from Dr. Abbott's cabinet, marked *Hyale;* and I also received it from Mr. Latham.

ART. XLI.—*On the Structure of the Antennæ in the Order* APHANIPTERA[a] *of Kirby, with reference to the Propriety of the Establishment of Genera upon the Variations of those Organs.* By J. O. WESTWOOD, ESQ., F.L.S. &c.

ON looking at the head of the flea, for the purpose of discovering its antennæ, two organs are observed placed in the ordinary situation of those members, and composed of four joints, which, from their general appearance, situation, structure, and usage, have been regarded by most naturalists as the true antennæ.

Latreille, however, from the philosophical manner in which he had studied the organization of the whole of the annulose subkingdom, had very early acquired a knowledge of the fact, that in different groups the same organ is often employed in a totally different manner, supplying the place, as well as the use, of another organ which is either entirely obsolete, or which has itself undergone an equally extensive modification: hence, by tracing these supposed antennæ to their place of insertion, he was induced to consider them rather as palpi.

Where, then, were the analogues of the true antennæ?—Behind the eye, on each side of the back of the head, a small oval-oblong impression is perceived, which incloses a minute organ, which in the living insect is kept in constant motion. Respecting this apparatus, Latreille observes, in his *Histoire Naturelle et Générale*, &c.: "*Est-ce un organe servant à la respiration? Seroit-ce une antenne? Je ne puis prononcer.*"

Mr. Curtis, in illustrating the genus *Pulex*, (Brit. Ent. 114, April, 1826,) stated the *Pulex irritans* to be the *type* of the genus, figured the *P. Talpæ* as an example, and gave an admirable series of dissections of the mouth of *P. Canis*, with

[a] I adopt Mr. Kirby's term, (Dugès having proved its appropriateness,) in preference to *Suctoria*, used by De Geer and Latreille, that name not being in accordance with the other names of orders; to *Aptera*, as restricted to the flea by Lamarck and MacLeay, considering it improper to apply to one group a term intended originally to designate many very distinct groups, and which has been employed by various naturalists in so many different ways; and to *Siphonaptera*, proposed by Latreille (as being preferable "*à celles trop vagues ou trop générales de suceurs et d'aptères,*" and adopted by Curtis and Dugès,) Mr. Kirby's name having the priority.

the observation: "The cavity behind the eye, which appears to be partly closed by a small lobe that may be distinctly seen to rise and fall, I am disposed to believe is an organ of respiration rather than the analogue of the antennæ, as suspected by my friend, Mons. Latreille; and the absence of spiraculæ down the sides of the abdomen strengthens my opinion. Little as we know of the uses of the antennæ beyond the sense of touch, it is impossible to say that the maxillary palpi may not perform in this order the office of antennæ, and that the orifice behind the eye may not be also adapted to hearing."

Subsequently, however, Mr. Curtis obtained specimens of *P. Hirundinis*, in which the antennæ "are as long as the head, placed above the eyes, and received when at rest into a deep groove, and when erected look like the ears of a rabbit. They are four-jointed, and the basal joint has a few long bristles."

In the summer of 1831, I had occasion to investigate the structure of this order, and gave much attention to this portion of the subject; and, after considerable trouble, succeeded in extracting the antennæ of several specimens of *P. Canis* from their cavity behind the eyes. In this species these organs are broad and four-jointed; the first joint is short; the second larger, and somewhat cup-shaped, and produced on the outside with numerous rigid setæ at the external angle, forming a defence to the terminal joint, which is large, ovate, or rounded, and subdepressed with numerous denticulations on the outer edge; the third joint is short and narrow, forming the base of the fourth joint.

In the 417th plate of Mr. Curtis's British Entomology for August 1832, another species of flea was illustrated under the name of *Ceratophyllus elongatus*, with the observations, that, from repeated examinations, that gentleman had found it necessary to divide the *Pulices* into two genera; that the *P. Talpæ*, previously figured as an example of the genus Pulex, belonged in fact to the new genus; and that the discovery of the antennæ of *P. canis*, by Mr. Haliday, rendered it necessary to erase the paragraph in the 114th folio, quoted above. A copy of Mr. Haliday's figure of the antennæ of the latter species (which is considered as a true Pulex) is introduced into Mr. Curtis's plate of *Ceratophyllus;* but it is not quite correct, being described as only two-jointed, the basal joint having only a single

bristle near its internal apex. The dissections of *Ceratophyllus* are taken from the *Pulex hirundinis*, which is considered as the type, and of which the antennæ are described as slightly attenuated and four-jointed, although one of them is represented in the plate as five-jointed. Of the species figured as the example of the genus, *Cer. elongatus*, the antennæ are not described; but in fig. 16 they are represented as eight-jointed, the basal joint being pear-shaped, the second subcyathiform, and the remainder transverse, forming a thick oval mass. In the coloured figure of this insect, these organs are however represented of the same attenuated form as in *Cer. hirundinis*, and apparently having only six joints. And in the *Pulex talpæ*, which is expressly stated to belong to *Ceratophyllus*, the antennæ are described and figured as ten-jointed, the basal joint being ovate-truncate, and the nine remaining annulose, and forming a rather elongate-ovate mass. M. Duges, in his admirable "*Recherches sur les Caractères Zoologiques du Genre Pulex*," has described and figured the antennæ of various species of fleas. In the *P. irritans* they are described as three-jointed:[b] "*Le premier article est court, le deuxième long et épais, armé d'une grosse apophyse et d'un bouquet de poils, le troisième est plat, elargi en palette, et divisé en lanieres ou digitations de plus en plus courtes d'avant en arriere.*" The antenna of *P. canis* is described as "*peu différente de celle de l'espèce précédente, un peu plus grosse et plus courte.*" In the *P. musculi*, Dug. (*Cerat. muris?* Curt.) the antenna "*présente cette particularité, que le premier article est long et le deuxième court, le troisième peu large est strié en travers, et dentelé sur un de ses bords;*" and in the *P. vespertilionis*, this organ is "*presque toute semblable à celle du P. musculi.*"

Such are the various formations stated to exist in the antennæ of different species of fleas. Now on comparing the characters given by Mr. Curtis of his genus *Ceratophyllus*, with those of *Pulex*, it will be seen that, with the exception of the formation of the antennæ, scarcely the slightest difference

[b] Either M. Duges has overlooked the articulation which I noticed between the second and terminal joints, or I have mistaken the contracted base of the latter for a distinct articulation. From the numerous sketches, however, which I made of the antennæ of *P. canis* in various positions, I think myself warranted in considering the former to be the case.

is to be found between them. If, however, the antennæ are to be regarded as affording the characters of genera in this order, it must be evident, even from Mr. Curtis's plate of *Ceratophyllus* alone, that there ought to be a much greater number of genera established according to the variations in the structure of those organs.

I should however be inclined to consider, from analogy, that the antennæ of *P. canis* have the same number of joints as the *P. hirundinis;* and indeed I have but little doubt that all the other species are formed upon the same type, the supposed numerous articulations, represented by Mr. Curtis in some of the species appearing to me to be merely deeper impressions of the marginal denticulations of the terminal joint: indeed, according to M. Duges, the antennæ, both of the *Pulices* and *Ceratophylli*, are three-jointed, the only material difference consisting in the variation in the length of the first and second joints.

Hence it can scarcely be considered that the genus *Ceratophyllus* is well founded. The species, however, figured by Mr. Curtis, *Cer. elongatus*, as well as the *Cer. vespertilionis*, and probably *Cer. bifasciatus*, and *Pulex musculi*, Dug.; together with a Chinese species, which has been kindly presented to me by the Rev. Leonard Jenyns, exhibit a general form so different to that of the other fleas, that I cannot help thinking them, on that account, entitled to form a distinct group; for which (as the name *Ceratophyllus* must likewise be rejected in consequence of having been previously employed in botany) the generic name of *Ischnopsyllus* may not be deemed inapplicable, the characters of which I propose to detail in a memoir, upon which I am at present occupied, upon Bat Parasites.

In conclusion, I may be allowed to observe, without however venturing to offer any decided opinion upon so difficult a question, that no group of insects appears to afford so striking an instance in support of the opinion, that the antennæ are organs of hearing, as those of the order under consideration. Such, it will be seen from the passage quoted above, was the doubtful opinion of Mr. Curtis; and when we notice the peculiar form of the aperture in which these organs are placed, and its situation at the back of the head on each side behind the eyes, such an opinion seems to have some reasonable

foundation. I offer this observation to those who deem attempts to stifle inquiry into such abstruse points, by the aid of ridicule, to be as unphilosophical as it is to give, without hesitation, to an organ whose uses are, and probably ever will remain unknown, the name of another organ whose uses are perfectly understood; thereby equally tending to stifle inquiry by instilling the idea that the uses of the organ thus inappropriately named, had been clearly ascertained. To such persons I would also point out the admirable remarks of M. Straus-Durckheim upon the antennæ of the cockchaffer, which are also in favour of the opinion that they are instruments of hearing.

The Grove, Hammersmith. May 1, 1833.

Art. XLII. *Observations on Blight.* By Rusticus, *of Godalming.*

The hop-fly is an animal whose injury to man is perhaps not quite of an unmixed kind, for its depredations serve to keep up the price of hops so as to afford a tolerable profit to the grower; whereas, were there to be no fly, the crop would be larger than the consumption, and the price consequently not a remunerating one. I well recollect, that after the immense crop of 1826, the price did not repay the grower his rent, taxes, and labour; and the farmers, a set of men, I am sorry to say it, with less forethought generally than any other class of tradesmen, most improvidently went to work and were silly enough to grub up their hop-yards and sow wheat. This took place in several instances in the district between Farnham and Alton, and at the same time both in Kent and Herefordshire; and afterwards, when the price recovered, some of the finest pasture land in the world was ploughed up to make hop-yards which have not yet paid even the tithe; there is, however, a blight whose ravages are without any proportionate good, or any good at all that I am aware of: a thief that robs our sheep and our cows of their winter food, and often compels their owners to starve them to skin and bone, thereby causing murrain and all manner of disease to the kine, empty pockets to himself, and a host of accompanying evils; and this thief is a little glossy, tiny, skipping, hopping, merry-andrew kind of

a beetle, in common parlance known by a name the very mention of which elongates a farmer's countenance at least an inch and a half—the *turnip-fly*.

The turnip-fly [a] is not always of one kind, but the difference between them is not important, they only alter in their paint, their build is always alike: the most common is painted bottle-green; but in some fields all are painted black, with a white line from stem to stern on each side down the deck; they are so active, that the only way I could ever obtain them in the newly-sown fields was by sweeping the surface with a gauze net on an iron-hoop at the end of a strongish stick; they jump like fleas directly they see you. This insect, or rather its grub, commences its attack on the turnip directly it is up, devouring the two cotyledons and the little heart, and sometimes, in a few days, leaving the field as brown as the day it was sowed.

Schemes out of number have been tried to get rid of or kill this little pest wherever it has appeared, the particulars of which, if I were to relate, with the accompaniment which I must add, that they have all turned out to be failures, would not, I fancy, be of much use; but I one day was cogitating on the matter, and argued to myself thus:—it would be a difficult task to catch and kill twenty thousand fleas if shut up in a room with them; but it might not be quite so difficult to prevent twenty thousand fleas coming into a room where there were none previously; and the wisest way seemed to me to find out how they could come there. Now, as all straightforward inquiries of this kind are laughed at, and at once yclept theories, I kept all my operations to myself, and now, for the first time, offer them to the public. I am sorry to say they are yet incomplete, but still they will be found of some use to those who are disposed to pursue the subject.

I had always observed that there was the greatest quantity of grubs on very young plants, and that they were very various in size, and that it was not till the plants were a fortnight or three weeks old that the beetles appeared in any quantities;

[a] Our contemporary, Mr. Loudon, wishes us to show off our learning by "supplying the systematic names to the insects" of which Rusticus treats, or, as our correspondent would probably term it, interlard his observations with crack-jaw. The turnip-fly is an *Altica;* the one with white lines down the back is *A. Nemorum.*—Ed.

yet there were some beetles from the very first coming up of the plant: now I knew from experience, that the turnip-beetle fed on wild mustard and several other hedge plants, and therefore it was not at all an improbable thing, that when they smelt the fragrance of the fresh bursting cotyledons of their favourite food that they should skip down from their spring habitations, the hedges, and commence the attack. This would account for the few beetles observable from the first, but not for the numberless grubs which covered the cotyledons, riddling them with holes, and devouring the succulent stems, even that part which was covered by the ground. These must have sprung from eggs either left in the ground last year or have been laid on the turnip-seed itself and harvested with it in the autumn.

I first sowed some seed in a flower-pot with earth out of my garden; it produced the animal in abundance. Secondly, I inclosed the pot with pasteboard and canvas with the same success; but there was still a possibility of the enemy getting in, as I had not made the cover sufficiently close. Thirdly, I made a light frame, about eight inches square, covering it with very fine silk gauze, and carefully stopping the crevices of the door with pasted paper, and round the pot, where the cover was fastened on to it with putty, so that there was now no possibility of any thing coming to it from without; yet this experiment was attended with the same success: however, one point, that is, a negative point, was now proved, namely, that the fly did not come to the turnip from other plants; this was a point gained. Fourthly, I baked the earth in a cast-iron pot over the fire, and used no water to water the seed but such as I had boiled myself, applying it at the bottom of the pot in a common feeder, then I used the same care and took the same precautions as before—I did not take off the cover till the plants were of a considerable size, and I found them all a-hop with beetles. I had now made another step; that the beetle did not come from other plants, I had found before; but now it was clear that it was not in the earth nor in the water. Fifthly, with a lens I examined the seed, and found on it a number of white flattish substances, some seeds were without any, but there were generally one, two, three, four, and in one instance five, on a single seed; these I concluded to be eggs, and thought the only way now left me was to attack them; it would

have been easy enough to have poked them off with a needle, but I could not see how I was to employ a needle and a magnifying glass on a sack of turnip-seed; I recollected, however, that I had found that some salt and water into which I had once unintentionally dropped a paper of silkworms' eggs had killed them to an egg; it was therefore worth while trying in this case: I accordingly made some pretty strong brine, and soaked the seed in it for twenty-four hours, then dried it thoroughly, and with all the precautions I have mentioned above I sowed it again, and with a kind of success—there was not a single fly, but neither was there a turnip. Nothing discouraged at this, I tried again and again, and I found that, without weakening the brine, if the seed was only kept in it three hours, there were no beetles, but yet the seed came up as well as ever. I now practise this with turnip-seed, cabbage-seed, and, in fact, with the seed of all the cruciform flowering plants in common cultivation, (all of them being equally infested by the beetle,) and with very satisfactory success. I cannot say that I never find beetles on the young plants, but I never have a crop destroyed, or even seriously injured by them. The whole of the experiments mentioned above were made on the Swede turnip, which I find is generally more infested by these beetles than any of our older sorts. The experiments were all made prior to the year 1823, and have been waiting for a suitable opportunity of publication; the liberal mode of conducting your magazine affords that opportunity; and allow me to express the pleasure which a writer feels in seeing his own handywork appear in print. If an article is to have a slice cut out here and another there, in the obsequious endeavour to oblige some literary impostor, whose fame is to be kept up by the suppression of public opinion, then good-by to editorial independence.

A word more in support of the idea that the beetle lays eggs on the seed of the turnip. First, Self-sown turnip-seed is more infested than when sown in the usual way; Secondly, when turnip-seed is harvested over-ripe, as in very hot dry seasons, the produce has much more fly than when harvested unripe, or in wet and cold seasons; in these instances it is certain, from the exposure of the seed, both in ripening and falling, that the beetles must have much better opportunities for depositing their eggs on it; Thirdly, on shaking the

flowers of turnips which have been sowed for seed, a great many of the identical fellows will be found skipping about the cloths over which you shake them; I do not mean the little beetles, which are dark green, about the same size, and fly very easily, but the real turnip-beetle. (I send you specimens of both.) The flying-beetle is very common in all flowers that produce a good deal of pollen; I have seen fifty or sixty in a dandy-lion.[b] The real turnip-beetles do not eat pollen.

If you can stick in this note at the end of my turnip-fly epistle pray do so.—Lord F——'s beetle is a weevil; he has nothing to fear from it; if it strip the leaves off his beech-trees one year it will not do so the next. I well recollect, some years ago, seeing the fine beech-woods about Gloucester completely stripped by it in the middle of June; the next year the woods were as healthy and luxuriant as ever. The weevil appears and disappears without any known cause, like all other insect pests, and these irregular visitors are always difficult to deal with; I shall try, notwithstanding, to trace its habits, and shall feel much obliged for any further information his lordship may transmit through you.

I am, yours, &c. RUSTICUS.

Godalming, 1833.

ART. XLIII.—*Monographia Chalcidum.* By FRANCIS WALKER, ESQ. F.L.S.

(Continued from page 142.*)*

GENUS CRATOMUS, *Dalman.*

Caput transversum, maximum: oculi magni, laterales: ocelli in triangulum dispositi: mandibulæ arcuatæ, una tridentata, altera quadridentata: maxillæ elongatæ, externè in lobum productæ: palpi maxillares articulis 4, 1us. 2°. duplo longior, 3us. 2°. æqualis, 4us. subfusiformis 1°. æqualis: mentum elongatum, posticè conicum: labium fissum: palpi labiales triarticulatæ, 1us. linearis, 2us. brevior, 3us. latior: antennæ clavatæ, 13-articulatæ; 1us. elongatus, subarcuatus, versus medium crassior; 2us. elongato-cyathiformis; 3us. parvus, cyathiformis; 4us. et sequentes ad 10um. brevissimi, approximati, cyathiformes; clava triarticulata, ovata: thorax convexus, ovatus; prothoracis scutellum breve; mesothoracis scutum gibbum; scutellum magnum, obtusum; metathoracis scutellum benè determinatum, canaliculatum: abdomen subpetiolatum, convexum, breve, latum, contractum: pedes subæquales; coxæ magnæ; femora subclavata; tibiæ apice

[b] *Meligethes*, of several species, and *Altica Nemorum*.—ED.

spinis duabus armatæ; tarsi articulis 5, 1us. elongatus, sequentes longitudine decrescentes, 5us. præcedenti crassior et longior: alæ anticæ nervus solitus ramulum stigmaticalem emittens elongatum, arcuatum.

Cratomus may be distinguished from Perilampus (to which it is closely allied); and from the other Torymidæ, by the long and curved stigmal branch of the nervure of the wing: the only Pentamera which resemble it in this character, are the Cleonymidæ and some of the Eupelmidæ.

Sp. 1. Cra. megacephalus. Mas. *Cyaneo-niger, antennis pedibusque fuscis, tibiis 4 anticis tarsisque flavis, alis anticis fusco maculatis.*

Cynips megacephala. . . . . *Fabr. Ent. Syst.* 2. 103. 17.

Diplolepis megacephala. . . . . *Fabr. Syst. Piezat.* 149. 21. 2.

Perilampus (Cratomus) megacephalus. *Dalman, Kongl. Veten. Acad. Handl.* 1820.

Caratomus megacephalus. . . . *Dalman, Kongl. Veten. Acad. Handl.* 1822.

Caput thorace latius, punctatum, anticè profundè excavatum, utrinque bituberculatum: oculi ocellique nigri: antennæ breves, fuscæ, versus medium obscuriores: thorax et petiolus punctati: abdomen nitidum, glabrum: coxæ nigro-fuscæ; trochanteres flavi; femora fusca; tarsi flavi, articulus 1us. subtus productus, 5us. fuscus: alæ hyalinæ; anticæ prope medium fuscescentes; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 2 lin.)

Taken at Ripley, July 1827, and in Epping Forest, by J. F. Stephens, Esq.

July; on palings; near London.

Fabricius says that it inhabits decayed wood.

Sp. 2. "Cratomus nigripes. *Ater, pedibus toto nigris, alis hyalinis.*"

"Taken in my own garden, at the Hermitage, South Lambeth. J. F. Stephens."

The description and name of this new species were obligingly sent to me by Mr. Stephens.

Genus Epimacrus,[a] *Walker.*

Fem.—Caput sat magnum, thorace latius: oculi mediocres, laterales: ocelli supra verticem in triangulo dispositi: antennæ fronte infe-

[a] Ἐπὶ antè, μακρὸς longus.

riore insertæ, 11-articulatæ?[b], clavatæ, pubescentes; articulus 1us. elongatus, versus apicem crassior; 2us. et 3us. elongato-cyathiformes; 4us. et sequentes longitudine decrescentes, ferè rotundi; clava triarticulata, ovata: thorax elongato-ovatus: prothoracis scutum angustum; scutellum maximum, anticè angustius: mesothoracis scutum minimum; parapsides convexi, optimè determinati; scutellum parvum, ferè rotundum, depressum; paraptera et epimera parva: metathoracis scutellum magnum: abdomen elongatum, petiolatum, supra depressum, subtus carinatum, apice elevatum et compressum; segmentum 2um. magnum, supra medio retractum; 3um. breve; 4um. longius; sequentia parva: oviductus exsertus: pedes subæquales; coxæ magnæ; femora, præsertim postica, clavata; tibiæ rectæ, apice crassiores et spinis armatæ; tarsi articulis 5, 1us. longus, sequentes longitudine decrescentes, 5us. præcedenti longior et crassior: alæ superiores anticè et apice ciliatæ; nervus solitus ramulum emittens brevem, et mox abruptus.

I have placed this singular genus between Decatoma and Megastigmus, though it differs from both in many particulars. Like the Spalangiidæ, the antennæ are inserted in the lower part of the face, but the head is transverse, and not depressed. It has the prothorax developed like the Cleonymidæ; and like them also, the angle, formed by the stigmal branch with the continuation of the principal nervure of the superior wing, is more acute than in most of this tribe. The structure of the trophi will probably determine its natural situation.

Sp. 1. Epim. rufus. Fem. *Rufus, thorace et abdomine posticè nigris, antennis fuscis, alis hyalinis, fusco maculatis.*

Caput rufum, nitidum; vertex niger: oculi nigro-fusci: ocelli rufi: antennæ fuscæ, basi et subtus rufæ; clava articulis 2-præcedentibus longior et latior: thorax nitidus, subtus omninò rufus, prothorax rufus, posticè supra fuscus: mesothoracis scutum nigrum, anticè fuscum; parapsides prope scutum fuscescentes; squamulæ rufæ; scutellum nigrum, apice rufum: metathoracis scutellum scabrum, obscurum, nigrum: petiolus brevissimus, crassus, obscurus, scaber, rufus: abdomen nitidum, glabrum, cyaneo-nigrum, subtus fuscum, apice setosum; segmentum 2um. rufum, basi fuscum; 3um. rufum, supra nigrum: oviductus abdominis segmento ultimo paullo longior, fuscus, basi rufus: pedes

[b] The two ring-shaped joints of the antennæ apparent in most of the Pentamerous Chalcides are almost, if not entirely, obsolete in this genus.

rufi, supra pallidè fusci; tarsi flavi; ungues et pulvilli fusci: alæ hyalinæ; anticæ, ubi nervus solitus costam attingit fusco maculatæ, ubi ramulum emittit latè fusco-fasciatæ; nervus fuscus, ubi costam attingit incrassatus, ater; ramulus ater. (Alarum longitudo, 1½ lin.; corporis 1 lin.)

Taken near Stockton-upon-Tees, by the Rev. G. T. Rudd.

The Pentamerous Chalcides will form two divisions: of the first, the remaining families may be placed in the following order:

Ramulus stigmaticalis rectus.	Abdomen petiolatum		Fam. IV. Miscogasteridæ.
	Abdomen sessile.	Antennæ moniliformes	Fam. V. Ormoceridæ.
		Antennæ filiformes fusiformes aut clavatæ . .	Fam. VI. Pteromalidæ.
Ramulus stigmaticalis incurvus			Fam. VII. Cleonymidæ.

The second division includes the Eupelmidæ, Encyrtidæ, and a few genera, composed of very minute species, which connect the Encyrtidæ with the Tetramera. The only one yet described is Aphelinus, *Dalman.*

Family IV.—Miscogasteridæ.

Caput transversum: oculi laterales: ocelli in triangulum dispositi: *maris* antennæ filiformes, fusiformes aut clavatæ, 12—, 13-aut 14-articulatæ: *feminæ* antennæ filiformes aut clavatæ, 12-aut 13-articulatæ: mandibulæ 4-dentatæ, arcuatæ aut rectæ; nonnunquam una arcuata, altera recta: maxillæ elongatæ: palpi maxillares 4-articulati: mentum elongatum aut ovatum: labium integrum, anticè latum: palpi labiales articulis 3, 2°. brevi: thorax convexus, elongatus aut ferè rotundus: prothoracis scutellum anticè angustatum, aut subquadratum: mesothoracis scuti inter parapsides et scutum proprium suturæ duæ laterales benè vel minimè determinatæ; scutellum ovatum aut rotundum: paraptera et epimera triangula: metathoracis scutellum parvum aut magnum, plus minusve canaliculatum aut carinatum: abdomen petiolatum: oviductus plerumque absconditus: coxæ mediocres: femora gracilia aut subclavata: tibiæ rectæ, in nonnullis clavatæ aut subarcuatæ, apice spinis duabus armatæ: tarsi articulis 5; 1us. longus; sequentes longitudine decrescentes; 5us. præcedenti longior, crassior: alæ anticæ nervus solitus ramulum stigmaticalem emittens elongatum, rectum, simplicem.

Chrysolampus, Sphegigaster, Stilbula, Eucharis, and some species of Halticoptera belong to this family.

- Prothorax
  - subquadratus
    - *Mas.* et *fem.* Antennæ clavatæ . . . . . SYNTOMOPUS.
    - *Mas.* Antennæ filiformes . . . . . DIPARA.
  - anticè rotundatus. Thorax
    - brevis. Petiolus
      - brevis . . . . . PSILOCERA.
      - elongatus . . . . . PROSODES.
    - elongatus. Petiolus
      - elongatus . . . . . MERISMUS.
      - brevis. Tibiæ intermediæ
        - non clavatæ. Abdomen
          - *Fem.* compressum . . . . . TOXEUMA.
          - *Maris* et *fem.* clavatum . . . . . CORUNA.
        - varium non compressum nec clavatum. Antennæ *fem.*
          - 13-articulatæ. Articulus 5us.
            - mediocris. Nervus solitus cum costam percurrit
              - incrassatus . . . . . PACHYNEURON.
              - gracilis. Antennæ
                - *maris* fusiformes, *fem.* clavatæ. Abdomen convexum . . . . . CYRTOGASTER.
                - *fem.* clavatæ. *Fem.* abdomen supra depressum . . . DICYCLUS.
                - *maris* filiformes, *fem.* filiformes aut extrorsum crassiores. *Maris* palpi maxillares
                  - articulo ultimo dilatato. *Fem.* Abdomen supra depressum . . . . . } PACHYLARTHRUS.
                  - simplices. *Fem.* abdomen convexum . MISCOGASTER.
            - minutus . . . . . MICROMELUS.
          - 12-articulatæ . . . . . ISOCYRTUS.
        - clavatæ . . . . . SPANIOPUS.

Genus I. Syntomopus,[c] *Walker.*

Caput magnum, thorace latius: oculi mediocres: antennæ clavatæ, 13-articulatæ; 1us. elongatus; 2us. cyathiformis; 3us. et 4us. minimi; 5us. et sequentes ad 10um. in *mare* lineares, longitudine decrescentes, in *feminâ* æquales, subcyathiformes; clava triarticulata, ovata, articulis 2 præcedentibus paullò longior: thorax elongatus: prothoracis scutellum magnum, subquadratum: mesothoracis scutum conspicuum, suturæ distinctæ; scutellum magnum, latum, convexum: metathoracis scutellum benè determinatum, canaliculatum: petiolus linearis, sat elongatus: abdomen *maris* breve, ferè trigonum, depressum, apice latum, segmento 2°. maximo, sequentibus vix conspicuis; *fem.* elongato-ovatum, apice acuminatum, supra depressum, infra carinatum, segmento 2°. elongato, sequentibus brevioribus: oviductus subexsertus: pedes breves; coxæ magnæ; femora subclavata; tibiæ subarcuatæ; tarsi breves: alæ breves.

Sp. 1. Syn. thoracicus. Mas. *Viridis, antennis nigris, tibiis fuscis, tarsis stramineis, alis hyalinis.*

Caput punctatum: oculi rufo-fusci: ocelli rufi; antennæ nigræ; articuli 1us. et 2us. virides: thorax punctatus, obscurè viridis; metathoracis latera obscurè viridi-nitentia: petiolus crassus, punctatus: abdomen nitidum, glabrum, æneo-nitens: pedes virides; trochanteres fusci; genua flava; tibiæ fuscæ, apice basique flavæ; tarsi antici fulvi, 4 postici straminei, apice fusci: alæ hyalinæ: nervi pallidè fusci: stigma parvum, fuscum. (Alarum longitudo, $1\frac{1}{4}$ lin.)

September; Isle of Wight.

Sp. 2. Syn. incurvus. Fem. *Nigro-cyaneus, abdomine viridi-æneo, antennis nigris, tibiis fuscis, tarsis stramineis, alis hyalinis.*

Caput punctatum: oculi fusci: ocelli rufo-nigri: antennæ breves, nigræ: thorax punctatus, obscurus; metathoracis latera basi viridi nitentia: petiolus gracilis, punctatus, nigro-cyaneus, obscurus: abdomen nitidum, glabrum, viride, apice cyaneo-viride, segmentis posticè æneis: pedes virides; genua straminea; tibiæ fuscæ, apice basique flavæ, anticæ pallidiores; tarsi antici fulvi, apice fusci; 4 postici straminei, apice nigri: alæ hyalinæ: nervi

[c] Σύντομος brevis, πούς pes.

pallidè fusci: stigma parvum, fuscum. (Alarum longitudo, $1\frac{1}{4}$ lin.)

Taken by Mr. Davis; the end of August; on Blackheath.

Genus II. Dipara,[d] *Walker.*

Mas.—Caput magnum, thorace latius: oculi mediocres: antennæ filiformes, corpore longiores, 12-articulatæ; 1us. subfusiformis; 2us. cyathiformis; sequentes moniliformes, elongato-ovati, remoti, pilosi: thorax elongato-ovatus: prothoracis scutellum magnum, subquadratum: mesothoracis scutum conspicuum, suturæ valdè distinctæ; scutellum ovatum, convexum: metathoracis scutellum benè determinatum, canaliculatum: petiolus elongatus, abdomine vix brevior: abdomen convexum, ferè rotundum, segmento 2°. maximo, sequentibus supra vix conspicuis: pedes graciles, elongati; tibiæ rectæ: alæ angustæ.

Sp. 1. Dip. petiolata. Mas. *Atra, antennis fuscis, petiolo pedibusque flavis, alis hyalinis.*

Caput punctatum, subnitidum: oculi nigro-fusci: ocelli rufo-nigri: antennæ fuscæ, articulus 1us. flavus: thorax minutè punctatus, subnitidus; metathorax obscurus, scaber: petiolus minutè punctatus: abdomen nitidum, glabrum: pedes flavi; tibiæ 4 posticæ pallidè fuscæ: alæ hyalinæ pubescentes, apice ciliatæ; costa pilosa; nervi fulvi; stigma parvum, concolor. (Alarum longitudo, 1 lin.)

July; on grass; near London.

Genus III.—Psilocera.[e] *Walker.*

Mas.—Caput magnum, thorace latius; oculi mediocres: antennæ moniliformes, verticillato-pilosæ, corpore longiores, 13-articulatæ; 1us. elongatus; 2us. cyathiformis; 3us. minimus; 4us. et sequentes ad 10um. remoti; clava triarticulata, elongato-ovata, angusta, articulis 2 præcentibus brevior: thorax latus, ferè rotundus: prothoracis scutellum brevissimum: mesothoracis scutum breve, suturæ vix conspicuæ; scutellum convexum, breve, ovatum; paraptera et epimera benè determinata: metathoracis scutellum magnum, canaliculatum: petiolus brevissimus: abdomen ovatum, depressum; segmentum 2um. trientem occupans; 3um. vix brevius; sequentes brevissimi: pedes graciles; coxæ mediocres; tibiæ rectæ: alæ anticæ latæ.

[d] Δὶς bis, παρὰ juxtà.

[e] Psilus genus Insectorum, κέρας cornu.

Fem. ?—Antennæ extrorsum crassiores, 13-articulatæ; 1us. elongatus; 2us. cyathiformis; 3us. et 4us. minimi; 5us. et sequentes ad 10um. subæquales; clava triarticulata, elongata, apice acuminata, articulis 2 præcedentibus paullo longior: abdomen ovatum, supra depressum, infra carinatum, apice acuminatum; segmentum 2um. magnum; sequentes brevissimi.

Sp. 1. Psil. obscura. Mas. *Atra, antennis nigris, pedibus fuscis, tarsis flavis, alis fuscis.* Fem.? *Nigro-viridis, abdomine æneo-viridi, antennis nigro-fuscis, pedibus flavis, alis subfuscis.*

Mas.—Caput punctatum: oculi nigro-fusci: ocelli rufo-nigri: antennæ albo-hirtæ: thorax punctatus; latera læviora, nitidiora: metathorax minute punctatus: petiolus punctatus, obscurus: abdomen nitidum, glabrum; segmenta 2um. et 3um. nigro-ænea: pedes flavi; coxæ nigræ; femora fusca, apice basique flava; tibiæ concolores; tarsi postici apice fusci; 4 antici fusci, articulis 1°. et 2°. flavis; ungues et pulvilli fusci: alæ anticæ fuscæ, posticæ subfuscæ; nervi fusci; stigma parvum, concolor.

Var. β.—*Mar.* abdominis segmentum 2um. basi nigrum: tibiæ pallidè fuscæ, anticæ flavæ; tarsi fusci, basi flavi.

Fem. ?—Oculi ocellique rufo-fusci: antennæ nigro-fuscæ; articulus 1us. flavus: alarum nervi flavi; stigma parvum, concolor. (Alarum longitudo, $1\frac{1}{4}$—$1\frac{1}{2}$ lin.)

July; on laurels, amongst grass in fields; near London.

Genus IV.—Prosodes,[f] *Walker.*

Mas.—Caput magnum, thorace latius: oculi mediocres: antennæ clavatæ, 13-articulatæ, corporis dimidio longitudine æquales; articulus 1us. elongatus; 2us. cyathiformis; 3us. et 4us. brevissimi; 5us. et sequentes ad 10um. longitudine decrescentes; clava triarticulata, conica, articulis 2 præcedentibus longior: thorax latus, ferè rotundus: prothoracis scutellum brevissimum: mesothoracis scutum breve, suturæ vix conspicuæ; scutellum convexum, breve, ovatum; paraptera et epimera conspicua: metathoracis scutellum magnum, canaliculatum: petiolus abdominis triente longior: abdomen breve; segmentum 2um. maximum, sequentia obtegens, apice truncatum, basi excavatum: pedes graciles, femoribus tibiisque rectis.

[f] Προσῳδης inflatus.

In this, and in many other Hymenopterous genera, the petiole appears divided; but as the terms of the abdominal segments are not yet well defined, I have called both divisions the petiole. — *See Latreille, Cours d'Entomologie,* Tom. I. p. 231.

Sp. 1. Pro. ater. Mas. *Ater, antennis fuscis, pedibus flavis, alis hyalinis.*

Caput punctatum, obscurum: oculi nigro-fusci: ocelli rufo-fusci: thorax obscurus, punctatus; latera læviora, nitidiora: mesothoracis paraptera nigro-ænea: metathorax et petiolus minimè punctati: abdomen nitidum, glabrum: antennæ pallidè fuscæ; articulus 1us. flavus: femora posticæ fusco maculata; tarsi apice fusci, 4 postici straminei: alæ hyalinæ; nervi flavi; stigma parvum, concolor. (Alarum longitudo, $1\frac{1}{2}$ lin.)

June; on a window; near London.

Genus. V.—Merismus,[g] *Walker.*

Caput magnum, thorace paullò latius: mandibulæ rectæ, dentibus 4 parvis armatæ: maxillæ elongatæ, apicem versus internè in lobum productæ: palpi maxillares 4-articulati; 1us. et 2us. æquales; 3us. longior; 4us. elongatus, acuminatus: mentum elongatum, posticè conicum: labium elongatum, anticè rotundatum: petiolus elongatus: abdomen *fem.* ovatum, supra convexum, apice abruptè elevatum et acuminatum: pedes graciles; tibiæ rectæ.

The trophi are described from M. aculeatus.

Divisio I.

Thorax ovatus, posticè latior: prothoracis scutellum mediocre: mesothoracis scutum mediocre, suturæ vix conspicuæ; scutellum latum, convexum; epimera et paraptera distincta: metathoracis scutellum magnum: petiolus posticè angustior: *maris* abdomen ovatum, gibbum, apice subtruncatum; segmentum 2um. magnum; 3um. maximum; sequentia brevissima: *fem.* abdomen elongato ovatum: antennæ *maris* extrorsum crassiores, *fem.* sub-clavatæ, 13-articulatæ; 1us. elongatus; 2us. cyathiformis; 3us. et 4us. brevissimi; 5us. et sequentes ad 10um. æquales; clava triarticulata, elongato ovata, articulis 2 præcedentibus æqualis.

Sp. 1. Mer. aculeatus. Mas et fem. *Viridis, antennis, nigris, pedibus flavis, alis hyalinis.*

Caput punctatum: oculi rufo-fusci: ocelli rufi: antennæ nigræ; articulus 1us. viridis, basi fuscus; 2us. æneus: thorax punctatus:

[g] Μερισμὸς divisio.

petiolus abdomine vix brevior: abdomen nitidum, glabrum; latera nonnunquam æneo-nitentia: coxæ virides; trochanteres fusci; femora postica viridi-fusca, 4 antica basi fusca; tarsi apice fusci, antici fulvi, 4 postici straminei: alarum nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 1—1½ lin.)

Var. β.—*Mas.* femora flava, postica basi viridi-fusca.

Var. γ.—*Fem.* tarsi fusci, 4 postici basi straminei.

Var. δ.—*Fem.* thorax æneo-viridis: abdominis segmentum 2um. cupreo micans.

May; Southampton. September; Isle of Wight, and near London.

Divisio II.

Fem.—Caput thorace multo latius: prothoracis scutellum mediocre: mesothoracis scutum magnum, suturæ sat conspicuæ; scutellum ovatum, convexum, mediocre: metathoracis scutellum magnum, carinatum: petiolus linearis: abdomen elongato-ovatum, apice abrupte acuminatum et elevatum, subtus valdè carinatum; segmentum 2um. maximum; sequentia brevissima: antennæ clavatæ; articulus 5us. et sequentes ad 10um. longitudine æquales; clava ovata, articulis 2 præcedentibus longior.

Sp. 2. Mer. fronto. Fem. *Viridis, antennis nigris, pedibus flavis, alis hyalinis.*

Caput punctatum: oculi rufo-fusci: ocelli rufi: antennæ nigræ; articulus 1us. viridis: thorax punctatus: petiolus linearis: abdomen nitidum, glabrum; segmenta 2um. 3um. et 4um. apice obscure ænea: femora subtus fusco maculata; tarsi antici fulvi, 4 postici straminei, omnes apice fusci: alarum nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 1¼ lin.)

August; on grass in fields; near London.

Divisio III.

Mas.—Prothoracis scutellum minimum: mesothoracis scutum breve, suturæ vix conspicuæ; scutellum convexum, ovatum; paraptera et epimera mediocria: metathoracis scutellum magnum, elongatum, carinatum: petiolus linearis: abdomen ovatum, gibbum, abbreviatum; segmentum 2um. magnum; 3um. maximum; sequentia brevissima: antennæ extrorsum crassiores; articulus 5us. et sequentes ad 10um. longitudine decrescentes; clava elongato-ovata, articulis 2 præcedentibus æqualis.

Sp. 3. Mer. flavicornis. Mas. *Viridis, antennis pedibusque flavis, alis hyalinis.*

Caput punctatum: oculi ocellique rufo-fusci: antennæ flavæ; articulus 1us. apice fuscus: thorax et petiolus punctati: abdomen nitidum, glabrum: coxæ virides; femora crocea; tarsi 4 postici straminei, apice pallidè fusci: alarum nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, $\frac{3}{4}$—1 lin.)

July; on grass in fields; near London. September; Isle of Wight.

Divisio IV.

Thorax elongatus: prothoracis scutellum parvum: mesothoracis scutum magnum, suturæ optimè determinatæ; scutellum magnum, convexum, elongato-ovatum; epimera et paraptera magna: metathorax magnus; scutellum carinatum: antennæ *maris* filiformes, *fem.* extrorsum crassiores; articulus 5us. et sequentes ad 10um. elongati, longitudine decrescentes; clava valdè elongata, apice acuminata, articulis 2 præcedentibus æqualis *mar.* aut longior et latior *fem.*: petiolus linearis: *maris* abdomen ovatum, convexum; segmentum 2um. maximum basi canaliculatum; 3um. magnum; sequentia brevissima: *fem.* abdomen elongato-ovatum, subtus carinatum, apice elevatum.

Sp. 4. Mer. megapterus. Mas. et Fem. *Viridis, antennis fuscis, pedibus flavis, alis hyalinis.*

Caput punctatum: oculi ocellique rufo-fusci: antennæ fuscæ; articulus 1us. flavus: coxæ virides; *maris* tibiæ intermediæ pallidè fuscæ; tarsi pallidè flavi: oviductus subexsertus: alarum nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 1—1$\frac{2}{3}$ lin.)

Var. β.—*Mar.* pedes crocei; tarsi flavi.
Var. γ.—*Fem.* tarsi straminei; apice fusci.

July; on grass in fields; near London.

Sp. 5. Mer. clavicornis. Fem. *Viridis, antennis nigro-fuscis, pedibus rufo-flavis, alis subhyalinis.*

Præcedenti similis; antennæ crassiores; caput minus; thorax et alæ angustiores: caput punctatum: oculi ocellique nigro-fusci: antennæ nigro-fuscæ; articulus 1us. flavus, apice fuscus: tarsi 4 postici flavi, apice fusci: alarum nervi fusci; stigma parvum, concolor. (Alarum longitudo, 1$\frac{1}{4}$ lin.)

New Lanark, Scotland.

Divisio V.

Prothoracis scutellum parvum: mesothoracis scutum mediocre, suturæ sat conspicuæ; scutellum mediocre, ovatum, convexum: metathoracis scutellum magnum, carinatum: abdomen ovatum, convexum, subtus carinatum, apice abruptè elevatum; segmentum 2um. maximum, sequentia brevissima: petiolus quàm præcedentium brevior: antennæ subclavatæ; clava elongato-ovata, apice acuminata, articulis 2-præcedentibus longior et latior.

Sp. 6. Mer. rufipes. Fem. *Viridis, antennis nigris, pedibus pallidè rufis, alis subhyalinis.*

Caput punctatum, cyaneo-viride: oculi ocellique nigro-fusci: antennæ nigræ; articulis 1us. basi flavus: coxæ virides; tarsi antici fusci; 4 postici straminei, apice fusci: nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, 1 lin.)

September; Isle of Wight.

Genus VI. Toxeuma,[h] *Walker.*

Fem.—Caput mediocre, thorace vix latius; antennæ subclavatæ, 13-articulatæ; 1us. elongatus; 2us. elongato-cyathiformis, 3us. et 4us. minimi; 5us. et sequentes ad 10um. æquales; clava triarticulata, apice acuminata, articulis 2 præcedentibus longitudine æqualis: mandibulæ 4-dentatæ, arcuatæ; dens interna obtusa: maxillæ elongatæ, externè ciliatæ; palpi maxillares 4-articulati; 1us. brevis; 2us. et 3us. paullò longiores, subæquales; 4us. elongatus, acuminatus: mentum elongato-ovatum: labium latum, anticè rotundatum: palpi labiales breves; articulus 2us. brevissimus: prothoracis scutellum breve: mesothoracis scutum mediocre; suturæ optimè determinatæ; scutellum magnum, convexum, ovatum; paraptera et epimera distincta: metathoracis scutellum magnum, carinatum: petiolus brevissimus: abdomen elongatum, plus minusve compressum, subtus carinatum, apice elevatum et acuminatum; segmentum 2um. elongatum; sequentia breviora: oviductus exsertus, brevis: pedes graciles; tibiæ rectæ.

Sp. 1. Tox. fuscicornis. Fem. *Viridis, antennis fuscis, pedibus cingulatis, alis hyalinis.*

Caput punctatum: oculi ocellique, rufo-fusci: antennæ fuscæ; articulis 1us. viridis; 2us. nigro-æneus: thorax et petiolus punctati: abdomen nitidum, glabrum, æneo-micans: pedes rufi; coxæ

[h] Τόξευμα sagitta.

virides; trochanteres nigri: femora intermedia basi nigra; postica nigra, apice rufa; tibiæ 4 posticæ versus medium pallidè fuscæ; tarsi antici pallidè fusci; 4 postici rufi, apice nigro-fusci: alarum nervi fusci; stigma parvum, concolor. (Alarum longitudo, $1\frac{1}{4}$—$1\frac{1}{3}$ lin.)

Var. β.—Tibiæ intermediæ omninò rufæ.

July; on grass in fields; near London.

Sp. 2. Tox. Ericæ. Fem. *Viridis, antennis nigris, pedibus cingulatis, alis hyalinis.*

Antennæ nigræ; articulus 1us. viridis: abdomen pubescens, apicem versus setosum, basi subtus purpureo, cupreo, cyaneoque micans: pedes nigri; coxæ virides; femora apice rufa; tibiæ 4 posticæ nigro-fuscæ; anticæ pallidè fuscæ; tarsi antici pallidè fusci; 4 postici rufi, apice nigro-fusci: alarum nervi fusci; stigma parvum, concolor. (Alarum longitudo, 1—$1\frac{1}{3}$ lin.)

Var. β.—Abdomen cyaneo-viride.

July; on heath; near London.

Genus VII. Coruna,[i] *Walker.*

Caput magnum, thorace latius: oculi magni: antennæ 13-articulatæ, *maris* filiformes, *fem.* extrorsum crassiores et paullò breviores; articulus 1us. elongatus; 2us. cyathiformis; 3us. et 4us. minimi; 5us. et sequentes ad 10um. æquales, elongati; clava triarticulata, elongata, acuminata, articulis 9° et 10°. paullò longior: mandibulæ valde arcuatæ, dentibus 4 acuminatis armatæ: maxillæ elongatæ, apicem versus internè in lobum productæ: palpi maxillares 4-articulatæ; 1us. et 2us. æquales; 3us. brevior; 4us. acuminatus, 2 præcedentibus longitudine æqualis: mentum ovatum: labium anticè sinuatum: palpi labiales triarticulati; 2us. brevis: thorax gibbus, ovatus, posticè angustior: prothoracis scutellum parvum: mesothoracis scutum magnum; suturæ laterales optimè determinatæ; paraptera et epimera magna; scutellum magnum, ovatum: metathoracis scutellum conspicuum, canaliculatum: petiolus brevis: abdomen convexum, clavatum, basi angustum, *fem.* subtus carinatum et apice elevatum; segmentum 2um. elongatum, 3um. supra obtegens; 4um. mediocre; 5um. elongatum; 6um. et 7um. abbreviata: pedes graciles; tibiæ rectæ: alæ anticæ nervus solitus qua cum costâ concurrit incrassatus.

[i] Κορύνη clava.

Sp. 1. Cor. clavata. Mas et Fem. *Æneo-viridis, antennis fuscis, pedibus flavis aut fusco-flavis, alis hyalinis.*

Oculi ocellique rufo-fusci: antennæ fuscæ; articulus 1us. flavus; 2us. ater: pedes flavi; tarsi 4 postici straminei; ungues et pulvilli fusci: alæ hyalinæ; nervi fusci; stigma mediocre, concolor. (Alarum longitudo, $\frac{3}{4}$—$1\frac{1}{2}$ lin.)

Var. β.—*Mar.* viridis; abdomen æneum, apice viride.

Var. γ.—*Mar.* omninò viridis.

Var. δ.—*Mar.* femora omnia basi fusca; tibiæ posticæ et nonnunquam omnes basi pallidè fuscæ.

Var. ε.—*Fem.* antennæ nigro-fuscæ; articulus 1us. flavus, apice fuscus: alæ subhyalinæ.

Var. ζ.—*Fem.* femora postica pallidè fusca.

June to September; grass in fields, lime-trees, &c.; near London. September; Isle of Wight. New Lanark, Scotland.

Genus VIII. Pachyneuron,[k] *Walker.*

Caput magnum, thorace latius: oculi mediocres: *maris* antennæ filiformes, 13-articulatæ; 1us. elongatus; 2us. cyathiformis, subarcuatus; 3us. et 4us. minimi; 5us. et sequentes ad 10um. æquales, lineares; clava elongata, acuminata, articulis 9°. et 10°. longitudine æqualis: *fem.* antennæ subclavatæ, corporis dimidio longitudine æquales; articuli post 5um. longitudine decrescentes; clava elongato-ovata; mandibulæ arcuatæ, dentibus 4 acuminatis armatæ; dentes 2 interni minuti, approximati: maxillæ elongatæ, externè ciliatæ: palpi maxillares filiformes; articuli 1us. et 2us. æquales; 3us. paullò longior; 4us. elongatus, acuminatus: mentum elongatum, angustum: labium latum, transversè lineatum, anticè rotundatum: palpi labiales articulis subæqualibus 3°. acuminato: prothoracis scutellum brevissimum: mesothoracis scutum breve; suturæ laterales vix conspicuæ; paraptera et epimera majuscula; scutellum latum, convexum: metathoracis scutellum sat magnum, carinatum: petiolus brevissimus: *maris* abdomen elongato-ovatum, depressum; segmentum 2um. elongatum; sequentia breviora: *fem.* abdomen ferè rotundum, supra depressum, subtus convexum: pedes graciles; tibiæ rectæ: alæ anticæ nervus solitus qua cum costâ concurrit incrassatus.

Sp. 1. Pach. formosum. Mas. *Viride, antennis fuscis, pedibus flavis, alis hyalinis.* Fem. *Æneo-viride, antennis nigris, pedibus flavo-fuscis.*

[k] Παχὺς crassus, νεῦρον nervus.

Mas.—Lætè viridis: oculi ocellique rufo-fusci: antennæ pallidè fuscæ; articulus 1us. flavus, apice supra fuscus: mesothoracis scutellum æneo-viride: abdomen anticè cupreum: pedes lætè flavi; coxæ virides; tarsi apice, ungues et pulvilli fusci: alarum nervi fusci; stigma concolor parvum.

Fem.—Obscurè æneo-viridis: caput viride: oculi ocellique fusci: antennæ nigræ; articulus 1us. pallidè rufus, apice fuscus: mesothoracis scutellum æneum: abdomen nitens, viride, medio cupreum: pedes flavo-fusci, subtus pallidiores; coxæ virides; tarsi apice fusci. (Alarum longitudo, 1—1½ lin.)

Var. β.—*Mar.* thorax æneo-viridis.

Var. γ.—*Fem.* pedes rufi; tarsi flavi, apice fusci.

Var. δ.—*Fem.* nigro-viridis: abdomen viride: pedes flavi, femoribus basi tarsisque apice fuscis.

July; on windows, lime-trees, &c.; near London. September; Isle of Wight.

Genus IX. Cyrtogaster,[1] *Walker.*

Caput mediocre: oculi majusculi: *maris* antennæ 14-articulatæ, fusiformes; articulus 1us. elongatus; 2us. elongato-cyathiformis; 3us. et 4us. minimi; 5us. et sequentes ad 11um. longitudine decrescentes; clava triarticulata, elongata, compressa, apice acuminata, articulis 2 præcedentibus longior: *fem.* antennæ 13-articulatæ, clavatæ; articulus 1us. antennæ longitudine ferè triens; 5us. et sequentes subæquales; clava elongata, apice conica, articulis 9°. et 10°. longior: mandibulæ arcuatæ, æquales, 4-dentatæ: maxillæ elongatæ, apicem versus internè in lobum productæ: palpi maxillares filiformes; articuli 1us. 2us. et 3us. breves, æquales; 4us. angustus, apice acuminatus, 3 præcedentibus vix brevior: mentum elongato-ovatum, basi conicum: labium anticè dilatatum et rotundatum: palpi labiales articulo 1°. mediocri; 2°. brevi; 3°. elongato, apice acuminato: thorax ovatus: prothorax parvus: mesothoracis scutum mediocre; suturæ laterales distinctæ; paraptera conspicua, triangula; scutellum magnum, convexum, ovatum: metathorax optimè determinatus; scutellum magnum: petiolus, mediocris, crassus: *maris* abdomen ovatum, convexum; segmentum 2um. maximum; 3um. majusculum; reliqua minima, sæpissime invisa: *fem.* abdomen subtus carinatum; segmenta versus basin retracta; 2um. maximum, 3^i^. latera amplectens; 3um. maximum; sequentia parva: oviductus in carinula ventrali

[1] Κυρτὸς curvus, γαστὴρ venter.

receptus, segmenti 3^i. apicem versus manifestus, trans abdomen vix exsertus: pedes graciles, subæquales, tibiis rectis, *maris* tibiis tarsisque intermediis latis: alæ breves.

Sp. 1. Cyr. vulgaris. Mas. *Viridis, antennis fuscis, pedibus fusco-flavis, alis hyalinis.* Fem. *Æneo-viridis, antennis nigris, pedibus fuscis, alis subhyalinis aut subfuscis.*

Mas.—Caput punctatum: oculi ocellique rufo-fusci: antennæ fuscæ; articulus 1us. apice 2^usque. omninò nigri: thorax punctatus: petiolus æneo-viridis: abdomen æneo-viride, nitidum, glabrum, pedes fusco-flavi; coxæ virides; tibiæ intermediæ nigræ; tarsi fusci, intermedii nigri: alæ hyalinæ; nervi pallidè fusci; stigma parvum, concolor.

Fem.—Obscurè æneo-viridis: antennæ nigræ: abdomen medio nigro-cupreum: pedes fusci, tibiis tarsisque 4 posticis nigro-fuscis: alæ subhyalinæ. (Alarum longitudo, $\frac{2}{3}$—$1\frac{1}{4}$ lin.)

Var. β.—*Mar.* femora antica et postica flava; tibiæ flavæ; intermediæ nigræ, basi fuscæ.

Var. γ.—*Mar.* mesothoracis scutellum viridi-æneum: abdomen apice nigro-cupreum.

Var. δ.—*Mar.* antennæ flavæ; articulus 1us. fuscus, apice niger; 2us. omninò niger: abdomen æneum, apice nigro-cupreum: pedes fusci.

Var. ε.—*Mar.* tibiæ posticæ fuscæ.

Var. ζ.—*Mar.* abdomen viride, apice cupreum.

Var. η.—*Mar.* pedes antici et postici omninò flavi.

Var. θ.—*Fem.* abdomen nigro-cupreum, apice æneum: tibiæ tarsique omnes nigro-fuscescentes.

Var. ι.—*Fem.* caput viride; thorax concolor; mesothoracis scutellum æneo-viride.

Var. κ.—*Fem.* thorax æneus: alæ subfuscæ.

Near London. September; Isle of Wight. New Lanark, Scotland.

It is common throughout the year, and is sometimes wingless: it inhabits moss in winter.

Sp. 2. Cyr. scotica. Fem. *Ænea, abdomine nigro-cupreo, antennis nigris, pedibus fuscis, alis subfuscis.*

Obscurè ænea, præcedenti angustior: antennæ graciliores, nigræ: caput posticè æneo-viride: oculi ocellique rufo-fusci: abdomen nigro-cupreum, basi lateribusque æneis: pedes fusci, tibiis apice

tarsisque nigris: alæ subfuscæ; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, $\frac{3}{4}$—1 lin.)

New Lanark, Scotland.

Sp. 3. Cyr. thoracica. Fem. *Nigro-ænea, antennis nigris, pedibus fuscis, alis fuscis.*

Oculi ocellique rufo-fusci: pedes-fusci; tibiæ nigro-fuscæ; tarsi nigri: alæ fuscæ; nervi fusci; stigma parvum, concolor. (Alarum longitudo, 1 lin.)

New Lanark, Scotland.

Sp. 4. Cyr. pusilla. Fem. *Ænea, antennis nigris, pedibus nigro-fuscis, tarsis flavis, alis fuscis.*

Oculi ocellique nigro-fusci: abdomen nigro-æneum: pedes nigro-fusci; coxæ æneæ; trochanteres fusci; genua flava; tarsi flavi, apice fusci: alæ fuscæ; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, $\frac{2}{3}$ lin.)

Obs.—A *C. vulgari* antennis gracilioribus, alis longioribus differt.

July; grass in fields; near London.

Sp. 5. Cyr. clavicornis. Fem. *Nigro-ænea, antennis nigris, pedibus rufo-fuscis, alis subhyalinis.*

Oculi ocellique rufo-fusci: antennæ nigræ: clava magna, lata: abdomen æneum, basi viride: pedes rufo-fusci; coxæ æneæ; femora basi genuaque rufa; tarsi rufi, apice fusci: alæ subhyalinæ; nervi fusci; stigma parvum, concolor. (Alarum longitudo, $\frac{3}{4}$ lin.)

July; grass in fields; near London.

Sp. 6. Cyr. obscura. Fem. *Nigro-ænea, antennis nigris, pedibus nigro-fuscis, alis fuscis.*

Oculi ocellique nigro-fusci: abdomen apice æneum: pedes nigro-fuscæ; genua fusca; tarsi concolores: alæ fuscæ; nervi fusci; stigma parvum, concolor. (Alarum longitudo, $1\frac{1}{4}$ lin.)

July; grass in fields; near London.

Obs.—Hæc species et præcedens a reliquis hujus generis alis longioribus et latioribus differunt.

Sp. 7. Cyr. rufipes. Mas. *Æneo-viridis, antennis pedibusque pallidè rufis, alis hyalinis.* Fem. *Viridi-ænea, antennis nigris, pedibus rufis, alis subhyalinis.*

Mas.— Lætè æneo-viridis: oculi ocellique rufo-fusci: antennæ pallidè rufæ: petiolus æneus: abdomen basi cyaneo-viride, apice nigro-cupreum: pedes pallidè rufi: tibiis apice tarsisque intermediis nigris, tarsis posticis apice fuscis; ungues et pulvilli fusci: alæ hyalinæ; nervi pallidè fusci; stigma parvum, concolor.

Fem.—Caput posticè viride: antennæ nigræ; articulus 1us. pallidè rufus, apice niger: mesothoracis scutellum æneum: petiolus viridi-æneus: abdomen nigrum, nitidum, ventre, lateribus apiceque æneis: pedes rufi; coxæ æneæ; tarsi pallidè rufi, apice fusci: alæ subhyalinæ; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, $\frac{2}{3}$—$1\frac{1}{4}$ lin.)

Var. β.—*Mar.* antennæ articulo 2°. fusco.

Var. γ.—*Mar.* abdomen viridi-æneum, apice cupreo-æneum.

Var. δ.—*Fem.* abdomen supra nigro-viride.

Var. ε.—*Fem.* abdomen omninò viride.

Var. ζ.—*Fem.* abdomen nigro-cupreum, basi viride, apice lateribusque æneis.

Var. η.—*Fem.* antennæ fuscæ: alæ hyalinæ.

Var. θ.—*Fem.* caput viride; thorax concolor; mesothoracis scutellum æneo-viride.

Common near London during the greater part of the year; sometimes wingless like *C. vulgaris*. New Lanark, Scotland.

Sp. 8. Cyr. tenuis. Fem. *Viridis, abdomine nigro-æneo, antennis quàm* C. rufi pedis *gracilioribus, pedibus obscurè rufis, alis subfuscis.*

Oculi ocellique rufo-fusci: antennæ nigræ; articulus 1us. fuscus: abdomen nigro-æneum: pedes obscurè rufi; tarsi rufi, apice fusci: alæ subfuscæ; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, $\frac{3}{4}$ lin.)

July; grass in fields; near London.

Sp. 9. Cyr. cingulipes. Fem. *Viridi-ænea, abdomine nigro-cupreo, antennis nigris, pedibus rufis, intermediis fusco-cingulatis, alis subhyalinis.*

Oculi ocellique rufo-fusci: antennæ nigræ; articulus 1us. nigro-fuscus: mesothoracis scutellum æneum: abdomen nigro-cupreum, margine ventreque viridi-æneis; pedes pallidè rufi, femoribus tibiisque intermediis fusco-cingulatis, tarsis apice fuscis: alæ subhyalinæ; nervi pallidè fusci; stigma parvum, concolor. (Alarum longitudo, $\frac{2}{3}$ lin.)

July; grass in fields; near London.

Art. XLIV.—*Notes on the Habits of Insects.*—By Delta.

"Agrestem tenui meditabor arundine musam."

Sir,—I have ventured to send you a few rough notes on a department of entomology which has been but little attended to in this country by real naturalists, having been left almost entirely to the care of literary hacks, hired by booksellers at a regular stipend per sheet to compile volumes, in which truth is to be sacrificed in order that the book may be *popular;* that is to say, may contain something wonderful, and calculated to catch the notice of the multitude. Should you consider these notes worth publication, I may perhaps send you a few more occasionally. I leave it to your judgment to publish these as a separate paper or amongst your "Varieties."

Chelostoma florisomne has always been a great favourite with me. Though not adorned with brilliant colours, or a pleasing external form, the male seems to me almost a faery being, a little Ariel, now sporting in the sunbeams, now reposing, not certainly "in the cowslip's bell," but in the corolla of that far fairer flower.

—— "dont Vénus compose ses bouquets,
Le Printemps sa guirlande, et l'Amour ses bosquets;
Qu'Anacréon chanta! qui formoit avec grâce,
Dans les jours de festins la couronne d'Horace."

But though the male is a perfect Sybarite, a mere voluptuary, the female is the very model of maternal industry, her whole life being spent in providing for her family.

Often, when amusing myself with guiding the young shoots of *Atragene Austriaca* or *Glycine Sinensis* along a trellis in my garden, have I observed the female anxiously examining the posts which support the trellis, especially on the sunny side. Having found one which is quite dry and a little going to decay, she commences by piercing a hole nearly horizontally, about an inch deep, then changing the direction, she proceeds as nearly in a perpendicular line as circumstances will allow. Her strong mandibles, bidentate at the apex, are the sole instruments with which nature has furnished her for this difficult task; but with these she contrives to gnaw the wood to a sort of sawdust, which she kicks out of the hole, passing it from one

pair of feet to the next. Occasionally she comes to the mouth of her hole, it may be to rest herself, or to look round and see that no enemies are near. This cylindrical hole, which is generally about ten or twelve inches long, is to be divided into nearly twenty cells, which are to be filled with food for her "*parvos Quirites*," one of which will occupy each cell.

Let us suppose a sufficient length of the post to be excavated, there remains a great difficulty to be got over. The egg which is first deposited will, of course, be the first to hatch, the earliest larva will, therefore, first become a pupa, and also will undergo the final change sooner than the younger part of the brood above. To guard against the confusion which must necessarily arise from this, she continues the hole, changing the direction of it until it assumes a horizontal course, and at length arrives again at the outside, thus leaving an easy escape for the first of the brood without disturbing those above, which will not appear for from two to five days later. In this, as in much else, the habits of this bee resemble those of *Xylocopa violacea*, as detailed by Réaumur, Tom. VI. p. 40, *et seq.*

She now closes the hole just above the lower bend with a partition, consisting of fine sand firmly glued together by means of a viscid saliva, with which she is copiously furnished.

What now remains for her to do is light and pleasing compared to her former labours—

> "Illa continuo saltus silvasque peragrat,
> Purpureosque metit flores et flumina libit
> Summa leves. Hinc nescio quâ dulcedine læta
> Progeniem nidumque fovet."

Having stored a sufficient quantity of food, which consists of pollen from the anthers and honey from the nectaries of flowers, for the support of one larva, she deposits an egg, and then closes the cell in the same manner as she formed the bottom of it. She now begins to store up more food, deposits another egg, and closes that cell, proceeding thus until she has quite filled the perpendicular part of the hole.

Her task now draws to a conclusion, she has only to close the two apertures; the lower one being intended for the outlet is merely closed in the same way as the cells, with very fine sand, but as the upper one is much more exposed to danger

from rain, which might penetrate it, and getting into the nest destroy the young larvæ, she first closes it in the same manner as the first, and then adds a layer of much larger grains of sand. Alighting on the gravel-path, she selects a grain suited to her purpose; she carries it to her nest, holding it in her mandibles, turns it about to find where it will fit best, then, guiding it with her maxillæ, and covering it with saliva from her tongue, she presses it down into its place, and flies off for another.

Μάστακα δ' οἷα τέκνοισιν ὑπωροφίοισι χελιδὼν
Ἄψορρον ταχινὰ πέτεται βίον ἄλλον ἀγείρειν.

Another and another are fetched until, the aperture being securely closed, her labour is done; she has provided for the continuance of her race, and with her maternal care ends also her life.

But after all her toil, it often happens that the whole of the brood is destroyed; and instead of our observing next spring the appearance of bees descended from the one whose labours we have observed, we see come forth a small Hymenopterous insect, having, like most dandies, nothing but a gaudy dress to recommend him.

Thus also does it sometimes happen, when some giant in science has been toiling day after day and night after night, bearing in mind the words of Moore, who is an Irishman—

"And the best of all ways
To lengthen our *days*
Is to steal a few hours from the *night*"—

when, after much toil and trouble, both of body and mind, he thinks to immortalize his name amongst scientific men, in steps some upstart, whose knowledge is mere outside show, and having clandestinely gained some little acquaintance with the object and result of his researches, endeavours, by a paltry appearance of priority, to defraud him of his just reward.

The intruder, in the case of our little insect, is *Chrysis cyanea*, which, during the absence of the mother, has deposited her eggs in the cells; the larvæ produced from these feed on the larvæ of the *Chelostoma*, and undergo their metamorphosis in cells prepared for these last.

Osmia bicornis also nidificates in the posts of the same *charmille*, which moreover affords food and dwelling-places to

innumerable *Tipulidæ* and many *Coleoptera*, as *Mycetæa fumata*, several *Anobia* and *Ptini*, *Sphæriestes 4-pustulatus*, &c., whose history, had I time, I might perhaps detail.

> "Verum hæc ipse equidem, spatiis exclusus iniquis,
> Prætereo, atque aliis post commemoranda relinquo."

I am not quite sure that this bee does not bore holes into posts, &c., but it mostly chooses an old bolt-hole, a hollow in a wall where the mortar has fallen out, or, where bees are kept, the space between the hive and the pan usually placed as covering on the top.

The appearance of the male is generally synchronous with that of *Anthophora retusa* and the flowering of the bulbous fumitory. The female is rather later, and is not generally out before the flowering of the plum, or even apple, in the blossoms of which she seems to take great delight. The weather at this time is often stormy, and then we frequently see her alight on the ground, pick up two or three grains of coarse sand and fly off with them. Virgil probably mistook this insect for a hive-bee, no doubt from seeing it fly to his hives, the construction of which would just suit our insect. He says—

> "———————— et sæpe lapillos
> Ut cymbæ instabiles fluctu jactante saburram
> Tollunt: his sese per inania nubila librant."

I have read somewhere of a very learned friar, I forget his name, who was so thin and light in his body (a *rara avis* truly he must have been), that he always in windy weather filled his pockets with pebbles lest he should be blown away, but I much doubt whether any bee ever carried stones for the same purpose.

The real object of her carrying them is the formation of her nidus, which is composed of a number of separate oval cells, consisting entirely of clay and sand, glued together with her saliva, and disposed irregularly according as she best can find room to place them. However close they may be to each other, she never makes the side of one cell serve also for another; each cell, though mostly touching, is quite distinct from its neighbours,—a waste of materials we do not often observe in nature. When all the cells (which are about twenty or thirty in number) are completed, she covers the whole of the exposed parts with a coating of the same materials as she

employed in their formation. The larvæ when full grown spin a rather thick, brown, silky cocoon, in which they undergo their metamorphosis. The imago is perfectly developed in autumn, but does not quit the cells till spring.

Trochilium tipuliforme, as is well known, is very injurious to the common currant, its larva feeding on the pith of the younger branches; but there is another insect, whose ravages do not appear to have attracted so much notice, perhaps from its being more local, or it may be that the mischief it occasions has been attributed to the more generally known destroyer. Here, although *T. tipuliforme* is very common, the injuries it occasions are not one-tenth so great as that of a little moth, *Lampronia capitella*.

It is nothing uncommon in the spring to see a large and flourishing currant-bush just putting forth its leaves, and then in a few days wither away; just so—"si magna licet componere parvis"—does he whom misfortune has overtaken in his youth wither away beneath the blighting influence of the sorrow which preys upon his heart.

If we examine the young shoots, we find within them a small reddish caterpillar, with something in its external form, which, combined with its colour, forcibly reminds us of that of *Cossus ligniperda*. Apparently, this larva enters the shoot about an inch up it, and penetrates downwards quite to the bottom of the shoot, eating the pith of this part of the shoot. It then proceeds to a second, and even a third; and when full fed undergoes its metamorphosis at the bottom of the shoot. In about five weeks the imago appears—"maculis insignis et auro"—and may be seen flying in swarms around the currant-bushes.

Should any one be disposed to consider the above notes as trifling and useless, I beg leave to say, that in all the cares, troubles, and disappointments in life which I have met with, and these are not few, I have found nothing so useful in driving away despondency, in reviving hope, as the study of nature. Truly has La Lepède said, that all that has been spoken by philosophers of learning in general can be said with far greater emphasis of the study of natural history. To use his own words, "Elle enchante nos jeunes anneés, elle plaît à l'âge mûr, elle pare la vieillesse de fleurs, dissipant les chagrins, calmant les douleurs, écartant les ennuis, allégeant le

fardeau du pouvoir, soulageant du souci des affaires pénibles, faisant oublier jusques à la misère, consolant du malheur d'une trop grande renommée,—quelle adversité ne diminue-t-elle pas?" I am, yours most truly,

Δ.

Colchester, May, 1833.

Art. XLV.—*Establishment of the Entomological Society of London.*

Nothing more clearly demonstrates the increasing taste for a particular science than the establishment of a separate and distinct society for the accommodation of its advocates. It was thought a very unnecessary step when the Linnæan Society first associated itself as distinct from the Royal; again the Geological and Zoological Societies had many wise heads shaken at them, many opinions passed on their probably ephemeral existence; yet all these societies, notwithstanding manifold evil predictions, exist and flourish: why then should we not have an Entomological Society? The objects of the Royal Society are too multifarious, of the Linnæan too phytological, of the Geological too inanimate, and of the Zoological too vertebrate, for an entomologist to attend either with the slightest hope of meeting with his congeners. Under these circumstances it was deemed expedient to propose an Entomological Society, the objects of which should be the holding of periodical meetings for the reception and reading of papers connected with the subject; the publication from time to time of such papers as the Society or its council may consider worthy of publication; the forming a library and collection for the use of the members; and the general promotion of the science of entomology in all its branches;—objects in every respect so praiseworthy, that we feel the most lively satisfaction in giving the Society all the publicity and assistance in our power, and in heartily recommending our friends at once to enrol their names as members,—a recommendation they will be the more willing to attend to when they see the names of

the gentlemen appointed to manage the affairs of the Society. If there be a name endeared to every British entomologist; if there be a name respected both at home and abroad; if there be a name before which all party and illiberal feeling would hide its face, and turn abashed and trembling away, it is the name of him whom the Society has, with an accordant voice, placed at its head as honorary president. The acting president and the council are too well known to our readers, either as authors or zealous collectors, or in many instances as valued personal friends, to need any commendation of ours.

Agreeably to an invitation sent to his entomological friends, a party met at Mr. Children's, and, after due deliberation, agreed that it was expedient to establish a Society to be called the Entomological Society of London; that periodical meetings should be held to receive communications; that collections and a library should be formed; that communications of sufficient interest should be published; that all persons signifying to the secretary their wish to join the Society before the 1st of November should be original members, that all after that day should be elected by ballot; that the annual subscription should be one guinea; that original members should pay on entrance one guinea; elected members two guineas; and that the first general meeting should be held at the Thatched House, St. James's-street, on the 22d of May.

A copy of these resolutions was sent round to all the entomologists whose addresses could be obtained, and a meeting was accordingly held, at which Mr. Stephens was called to the chair.

The minutes of the previous meeting were read and signed.

Letters were read from Messrs. Griesbach, Wood, Babington, Davis, Broome, E. Doubleday, and Raddon, requesting that their names might be entered as original members; Messrs. Bowerbank, W. Christy, jun., J. F. Christy, Hanson, Newman, and Walton, who were present, signified in writing their wish to become original members; the names of Messrs. Wailes and Hoyer were handed in for the same purpose; a letter was read from the Rev. Mr. Kirby, declining to take an active part in the management of the Society.

The CHAIRMAN said it would be the next business of the meeting to appoint a council to manage the affairs of the Society, out of which council the higher officers must be

chosen. A paper was then handed round the table, on which it was competent to each member to write the name of any gentleman whom he considered worthy the honour of being placed on the council. When the paper again reached the chair it contained the following names, to none of which any objection being made they were declared duly elected.

CHILDREN, J. G. ESQ., *Sec. Roy. Soc.* &c.
DAVIS, A. H. ESQ., F.L.S., &c.
GRAY, I. E. ESQ., F.R.S., &c.
GRAY, G. R. ESQ.
GRIESBACH, A. W. ESQ., B.A.
HOPE, REV. F. W., M.A., F.L.S., &c.
HORSFIELD, T. ESQ., M.D., F.R.S., &c.
NEWMAN, E. ESQ., F.L.S., &c.
STEPHENS, J. F. ESQ., F.L.S., &c.
SYKES, LIEUT.-COL., F.L.S., &c.
VIGORS, N. A. ESQ., M.P., M. A., F. R. S., &c.
WATERHOUSE, G. R. ESQ.
YARRELL, W. ESQ., F.L.S., &c.

The CHAIRMAN said the next business before the meeting was the appointment of a President.

MR. CHILDREN said there was a gentleman whose entomological labours had for a long series of years been an honour to this country, and to whom he was sure every entomologist must look up with feelings of the warmest esteem and most profound respect; and although, from the fear probably of not being able to bestow that time and attention on the affairs of the Society which he thought it might claim, he had in the letter just read declined taking any active part in it; yet he (Mr. Children) questioned whether the Society would be altogether testifying its feelings towards the individual to whom he alluded unless it conferred on him the highest honour it had in its power to bestow; many gentlemen would be aware that the Entomological Society of France had conferred on the learned and now lamented Latreille a title which did not oblige him to take any more active part in the affairs of that Society than his own inclination might induce or his leisure permit. The title he alluded to was that of *honorary* president, and with the permission of the chair he would move—

That the Rev. W. Kirby be appointed Honorary President of this Society.

COLONEL SYKES seconded the motion, which was then put from the chair, and carried unanimously.

MR. NEWMAN then moved, and the REV. MR. HOPE seconded—

That J. G. Children, Esq. be President of this Society.

MR. YARRELL moved, and the REV. MR. HOPE seconded—

That N. A. Vigors, Esq. be one of the Vice-Presidents of this Society.

COLONEL SYKES moved, and MR. CHILDREN seconded—

That J. F. Stephens, Esq. be one of the Vice-Presidents of this Society.

MR. GRAY moved, and MR. WESTWOOD seconded—

That Dr. Horsfield be one of the Vice-Presidents of this Society.

COLONEL SYKES moved, and MR. YARRELL seconded—

That the Rev. F. W. Hope be Treasurer and Vice-President of this Society.

REV. MR. HOPE moved, and MR. CHILDREN seconded—

That G. R. Gray, Esq. be Secretary of this Society.

MR. WESTWOOD moved, and the REV. MR. HOPE seconded—

That G. R. Waterhouse, Esq. be Curator of the Collections and Librarian of this Society.

MR. YARRELL moved, and MR. CHILDREN seconded—

That, in consequence of the advanced state of the present season, no further meeting of the Society is expedient till November next, on a day to be fixed by the Council, who will in the interim be engaged in deciding on a place of meeting, of which due notice will be given: that the Council frame laws to be then submitted for approval; that it is not considered necessary that any payment should be made till the meeting in November, which will be considered the anniversary, and on which the annual subscription will be due.

MR. NEWMAN moved, and MR. CHILDREN seconded—

That the Thanks of this Meeting be given to MR. STEPHENS for his very able and obliging conduct in the chair.

The whole of these resolutions were carried unanimously, and without the slightest difference of opinion being expressed on any of them; and the meeting altogether passed off with that perfect good humour, cordiality, and good feeling which we hail as an earnest of its future prosperity,—for in concord there is strength.

We conceive the main objects of the Entomological Society to be—1st, The formation of a *well-named* collection; and for this purpose we most earnestly and respectfully solicit for the Society donations of specimens, particularly of those genera and species which are newly-named and described; if these be labelled by the first describer, and thus openly exhibited to

all inquirers, much of the present confusion and misunderstanding about priority might be avoided, and moreover a very essential service rendered to beginners. 2dly, The formation of a library; and to assist in this we think that every author should make the Society a present of his own works, or copies of papers published in periodical works. 3dly, The reception of scientific papers: we would venture to suggest that these should be read by their authors, that during the reading silence should be maintained, and that each paper should become the subject of discussion, during which only one member should be allowed to speak at a time, and that until the chair had been vacated no general conversation should take place. We merely throw out these hints; if the council do not consider them worth attending to we shall be perfectly satisfied without making any attempt to enforce them; but it is easier to avoid the acquisition of bad habits than to escape from them when acquired; and the constant conversation during the reading of papers at learned societies in general we really must consider somewhat indecorous.

Art. XLVI.—*Osteology, or External Anatomy of Insects.*

By Edward Newman, Esq., F.L.S.

"I find it impossible to give, according to the present state of science in England, any satisfactory description of insects without making some previous observations on their anatomical nomenclature." MacLeay.

"Ce que personne n'avait encore tenté j'ai osé l'entreprendre." Savigny.

Letter I.—On the Primary Parts of Insects.

Sir,—It is with a full consciousness of my inability to render it justice, that I undertake a subject from which all our entomologists seem to have shrunk, viz. the substitution of a natural nomenclature of the parts of insects for the artificial one proposed by Linnæus, which is still in universal use; but I have always considered that it is more commendable to do our best, however short of perfection that best may be, than to procrastinate the little service we may render to others, in the vain and selfish hope that we may hereafter render our labours so complete as to be an object of general praise. The more

closely and attentively I regard the structure of that portion of animals to which my present observations will be exclusively confined, the more thoroughly am I convinced that this branch of science is yet in its very infancy. I may perhaps be reminded that Lyonnet, Leon Dufour, Chabrier, Herold, and Sträus-Durckheim, have, by their unconquerable industry and surpassing skill, accomplished wonders;—I may be told that Savigny, Andouin, and MacLeay, have, by the vigour and comprehensiveness of their minds, and their extraordinary talent in the application of observations, arrived at great and important results;—and I am willing to admit all this;—but, though great the researches in this science, and apposite their application, the same objection may be taken to them all, that they tend to illustrate a theory in itself evidently false, rather than to find out and establish plain and solid truths. It appears to me somewhat singular, that entomological writers, who have so boldly and unceremoniously attacked and altered the disposition and nomenclature of the groups proposed by Linnæus, should without exception have religiously adhered to that erroneous and artificial disposition and nomenclature of external parts, from which his principal faults in grouping and systematic arrangement have arisen. All nomenclature of parts, which have only ideal limits, I would contend that common sense commands us to discontinue, believing that no name for any portion of an animal, the limits of which portion are unsettled or optional with the describer, and have no existence in nature, can be suitably retained or philosophically employed. In the comparative anatomy of higher animals we trace the same part through an almost infinite variety of modifications, yet apply to it the same name, and assign as characters its variations, as the variations of a single part; in the comparative anatomy of insects we can with ease detect the presence of the principal parts in every individual, yet have hitherto assigned such parts no common name, but name them variously according to their variations.[a] In examining a particular portion of an insect,

[a] Even this is more than we always accomplish. In turning over for the purpose twenty consecutive pages of two of the most highly esteemed British works on entomology, I find the most important segment of an insect is described or alluded to under the following names:—*manitruncus; collare; collum; thorax;*

I have considered it invariably with a strict attention to its relative value; that is, *first*, as to its relation to neighbouring parts in the same insect; *secondly*, as to its relation to the same part in other insects. I have endeavoured to avoid bringing into notice extravagant or monstrous appearances in particular genera or species, as exemplifications of any proposition, believing that these bear no higher value, in a general system, than a deformed individual does in a species; that they are not plans of nature, but departures from her plans; not rules of nature, but exceptions to her rules: for the entomologist cannot but observe, that these strange conformations are not necessary developments of muscle for the support of increased action in organs of locomotion, &c.; for where the increased use of either pair of locomotive organs is observable, the segment bearing those organs is increased in volume through whole orders, or even classes; and is never, as far as I have yet observed, limited in its increase to a genus or family. I fear, that in thus generalizing, I shall by some be charged with being superficial; but it is my firm impression, that we have been too prone to insulate facts; too eager to notice and comment on wonders, which would probably cease to be such were the range of our meditations allowed a wider field.

On the subject of system it may be thought that I have elsewhere indulged somewhat too freely,—a point which time must settle: I have merely made such allusions to it here as the subject of the present essay renders compulsory; for instance, in tracing the progressive development of particular parts, I have adhered to the position of the seven classes which I formerly proposed; and in doing this I furnish the reader with a test by which the worth of any system may be

prothorax; mesothorax; scutellum; manitrunk; collar; ring; neck; behind the head; anterior margin of thorax; anterior portion of thorax; anterior part of thorax; segment of thorax; first segment of thorax; anterior segment of thorax; first portion of the trunk; first segment of the trunk; second segment of thorax; second segment in an insect. Inferior writers have added to this list, as have also the writers above alluded to in other parts of their works. The names now in use in this country alone for this one segment, considered as a whole, are thirty-nine. The fore-wings of insects are called *elytra, hemelytra, pseudelytra, tegmina, coriaria, alæ, alæ anticæ, alæ primæ, alæ primores, alæ primariæ, alæ anteriores, &c. &c.*, besides English names.

tried; and it will be quite impossible for myself, or any systematist, to explain away obvious relationships dependent on essential similarity of structure, if indeed the grouping together of intrinsically similar conformations be, as I suppose, the basis of natural arrangement.

Animals are formed on a number of perfectly distinct plans: the organs which answer the purposes of perpetuating the kind, of sustaining life, and of moving from place to place, are present in all; but the mode of their appearance affords those characters which serve best to separate the kingdoms of animals from each other.

Many animals are merely an homogeneous jelly, inhabiting the water, and adhering to earthy or vegetable substances, or protected by an earthy tube secreted by their own bodies; of these, the history, *i. e.* the reproduction and mode of existence, seems to foil inquiry, and to throw every impediment in the way of those who would draw the line between the animated and vegetable portions of the universe; but, as we rise in the scale of animated beings, we find they acquire the power of locomotion, and either fly in the air, walk on the earth, or swim in the water, moving at will from object to object, as the great incentives to action, love and hunger, destined wisely for the increase and sustenance of animal life, may induce them. In these we find the body consists of two principal portions besides the organs immediately connected with the continuance of life: these portions are commonly known as bone and muscle; the bone is solid, hard, and capable of fracture, and serves for the attachment and support of the muscular parts, which are softer, generally incapable of fracture, and yield before the slightest pressure, by the motion of their composite particles *inter se*. The disposition of bone and muscle varies in the groups in which these parts are distinct; the bone is sometimes an articulated frame-work to which the muscle adheres externally, clothing it as with a garment; animals formed on this plan are called *Vertebrata:* sometimes the bone is composed of little nodules, not articulated with each other, but strung together like beads by means of cartilaginous tendons; these are termed *Radiata:* sometimes the whole of the bone is united into one or two large pieces, which are throughout the greater part of their surface entirely unconnected with the animal, but constitute a

domicile within which it retires for protection; these are *Mollusca.* Lastly, in some animals the bone completely envelopes the muscle, as with a case, which is articulated externally and vertically, thus dividing the animal into a number of portions, segments, or *annuli;* whence the name *Annulata.*

An Insect, then, is an annulate animal; and its characters are these:—the bones are external, or perhaps, more correctly speaking, the skin in which the animal is inclosed has become solid, compact, and bony; and, like the bones of vertebrate animals, serves for the attachment and support of the softer and muscular parts, around which it forms a complete case or covering, which, owing to its liability to injury, consequent on its constant risk and exposure from its own activity, is absolutely necessary to protect it from that loss of life which must otherwise very speedily annihilate the kind. This case is vertically divided into thirteen segments; and each of these segments is sometimes[b] subdivided, both vertically and horizontally, into four; thus giving sixteen osseous plates or bones to every segment, or two hundred and eight to the whole trunk.[c] From the first of these segments arise the organs of manducation, vision, and two *antennæ,* which are the principal organs of touch; from the second, two legs; from the third, two wings and two legs; and from the fourth, two wings and two legs; these ten being the organs of locomotion: these organs are for the most part covered with the same osseous case as the trunk, and are articulated in a similar manner. In the sutures of the trunk, and also in those of the organs of locomotion, the connecting skin is membranous and pliable, affording freedom of motion when required; but there are exceptions to this.

The bony plates being always so formed as to meet accurately at their margin, and to play easily, and without injury

[b] I should suppose this may be invariably the case.

[c] Mr. MacLeay asserts that fifty-two segments is the *maximum* number in the *Chilognatha.* (Anatomy of the Thorax of Winged Insects, Zool. Jour. XVIII. p. 153.) In many of these, each segment very evidently consists of a dorsal, a ventral, and two lateral plates or bones, which would produce the number, two hundred and eight, as proposed above, and afford a striking fact in support of Andouin's excellent observation, that *the case of all Annulata is formed of a fixed number of parts, which may be distinct or united, but which exist in all.*

to the animal, by means of the connecting membranes, it becomes obvious that particular segments, from the active or peculiar use of the organs which they bear, must occasionally require a greater degree of freedom than others whose organs have no such active or peculiar use; and when strength, rather than activity in the articulation, is desirable, then a less degree of freedom will be best adapted to the purpose. In the human frame articulations are of three very obvious kinds: these are called, first, *diarthrosis*, in which the motion permitted is perfectly free, as that of the bones of our arms and legs; secondly, *synarthrosis*, in which no motion is permitted, as in the sutures of the bones of the skull; and, thirdly, *amphiarthrosis*, which partakes in some degree of both of the others, being a very limited motion, yet plainly distinguishable,—such is the articulation of the vertebral column. These three kinds of articulation, I believe, have been denominated familiarly, *moveable*, *immoveable*, and *mixed* articulation; terms so easy to be remembered, that I shall not hesitate in adopting them. Besides these, another anatomical term, *symphysis*, requires an introduction into entomology, or we must have recourse to an English analogue; by *symphysis*, in anatomy, is meant the natural union of bones, which in the *fœtus*, or even in early life, have been for a while distinct; thus, the under-jaw, which in man is one solid and compact bone, has originally been two, which have united in the front. A fifth anatomical term, also applicable to entomology, is *anchylosis;* it is employed when the synovial glands are wanting, and the customary articulation becomes ossified: it may generally be contrasted with *symphysis* by the observation, that *symphysis* naturally takes place as an approach to strength and perfection; *anchylosis*, more frequently as a consequence of accident, or disease. The application, however, of both these terms is very extensive, and often made, even by skilful anatomists, to widely different effects. Now, on the mode of articulation, together with the situation of the locomotive organs above detailed, much will be found to depend.

In Insecta, the first articulation is *moveable;* the second is *moveable;* the third *immoveable;* the fourth *varies;* the fifth *varies;* the sixth, and all the others, are *mixed*.[d]

[d] Subject, however, to exceptions hereafter to be detailed: the variations of articulation generally observable in insects will also be more fully explained.

Although every insect is composed of thirteen segments, all of these are not constantly observable; the existence of all, however, may be generally ascertained, though some of them under great variation in appearance; a segment occasionally almost disappearing, and on the contrary sometimes nearly hiding all the others by its magnitude;[e] being occasionally closely united to an adjoining segment;[f] and again, sometimes bearing on its surface an indentation[g] or fold,[h] giving to it the appearance of two: a segment, moreover, will frequently give rise to processes; these are of two kinds,—*apophyses*, which are merely bony excrescences, and evidently an intrinsic part of the segments;[i] and *epiphyses*, which are distinct appendages, with a moveable articulation;[k] great care is therefore required to avoid mistaking a mere process for a segment, and also to insure against overlooking segments which really exist.

For the thirteen segments observable in true insects, I would propose the following names:[l]

No. 1. (A. *B.*) CAPUT, bearing the organs manducation, vision, &c.
2. (C. *D.*) PROTHORAX, bearing the PROPEDES, or *fore-legs*. (a)
3. (E. *F.*) MESOTHORAX, bearing the PROALÆ, or *fore-wings* (e), and the MESOPEDES, or *middle legs*. (i)
4. (G. *H.*) METATHORAX, bearing the METALÆ, or *hind-wings* (o), and METAPEDES, or *hind-legs*. (u)
5. (I. *J.*) PROPODEON.
6. (K. *L.*) PODEON.
7. (M. *N.*) METAPODEON.
8. (O. *P.*) OCTOON.
9. (Q. *R.*) ENNATON.
10. (S. *T.*) DECATON.
11. (U. *V.*) PROTELUM.

[e] The prothorax, for instance, is scarcely discernible in *Musca*, while *Centrotus* appears all prothorax.

[f] As the *metathorax* and *propodeon* in *Melolontha*.

[g] As in *Pulex*. [h] As in some *Locustæ*.

[i] As in the *prothorax* of *Dynastes*, *Typhæus*, &c.; yet these apophysal appendages appear to have been not unfrequently described, named, and figured as primary parts; thus introducing into our nomenclature a mass of parts, the common existence of which it were vain to attempt to trace.

[k] As the appendages to the *telum* in *Phasma*, *Libellula*, &c.

[l] See Plate III. The letters between parentheses in this table apply to all the figures in this and succeeding plates on this subject.

Fig.1.

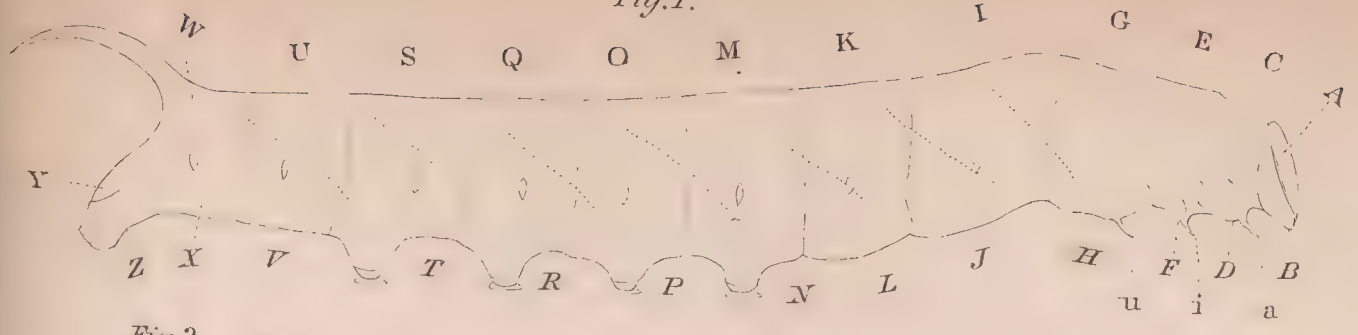


Fig.2.

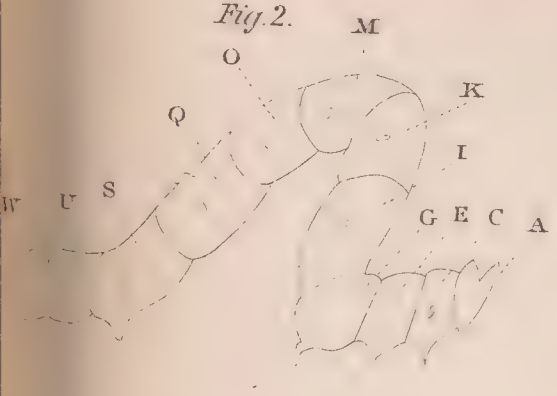


Fig.3.

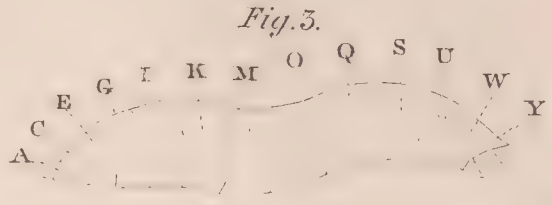


Fig.4.

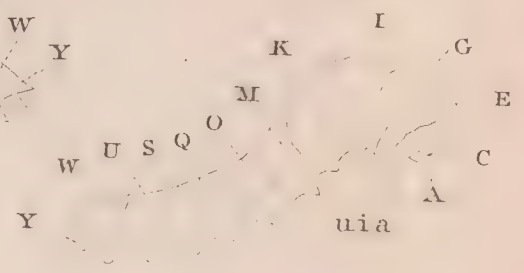


Fig.5.

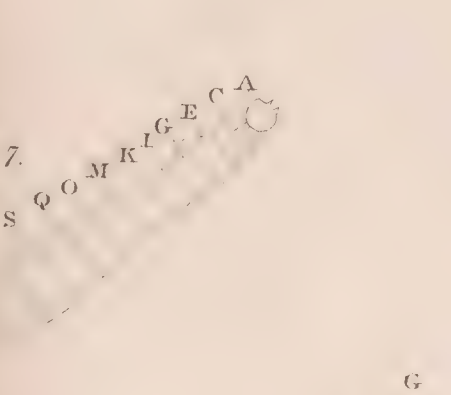


Fig.6.

Fig.7.

Fig 8

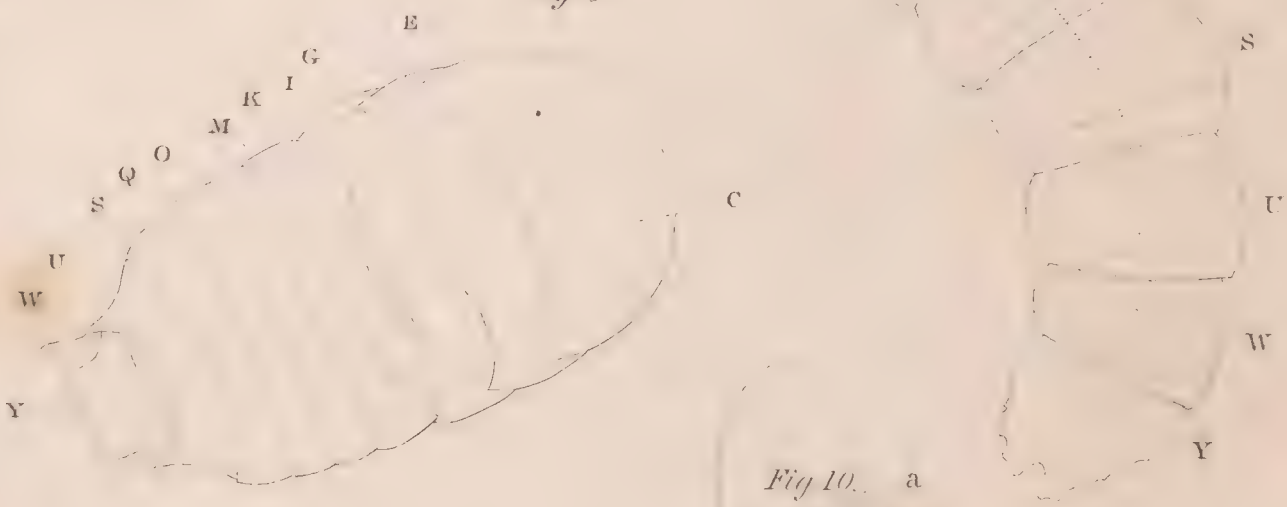


Fig 10.

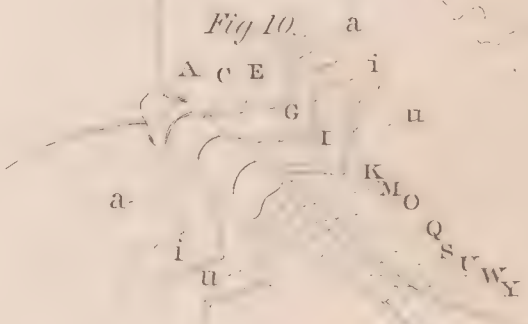


Fig.9.

T.Ingall Sculpt

12. (W. *X.*) PARATELUM.
13. (Y. *Z.*) TELUM, bearing the organs of reproduction,[m] or sometimes being confined to those organs[n] or weapons of defence.[o]

I will now state what has previously been done in this way. Linnæus divided an insect into *head*, *thorax*, and *abdomen;* a division, the propriety of which being universally acknowledged, has been employed by all writers [p] from his day to the present; yet a division diametrically at variance with nature: in fact, the limits of the parts were ideal; or, in other words, it has always been perfectly optional with a describer to limit the thorax to the second segment, or include in it any number, not exceeding the four following segments; and in this entomological writers have not been influenced by any philosophical rules, but have been guided solely by the relative size of the segments: the same has been the case with the abdomen, which may comprise seven, eight, nine, ten, or eleven of the segments; and it so happens, that the segments, which are thus either thorax or abdomen, bear the wings; so that the wings are either thoracical or abdominal appendages, as an entomologist pleases. In a beetle, they are generally considered abdominal; in a bee, thoracical. Chabrier and Andouin, in their excellent observations on the anatomy of insects, have applied to the wing-bearing segments the names which I have retained, and have treated the subject with great skill; the former renouncing the term *thorax* as applicable to a series of parts, but unaccountably leaving the reader to determine whether he shall consider the four wings as arising from one segment or two; for he expressly terms the site of these organs "*segment alifere*," and yet divides it into *mesothorax* and *metathorax*. Andouin, though a most accomplished writer and able reasoner, retrogrades a step, by again uniting the *prothorax* with Chabrier's "*segment alifere*," under the original name *thorax*. Kirby somewhat fancifully alters the term *prothorax* into *manitruncus*, and calls Chabrier's "*segment alifere*" *alitruncus;* giving to the two united the name of *truncus*. Knoch called the *prothorax* "*collum*," and the

[m] Except in the order *Libellulites*. [n] *Ichneumonites*, &c. [o] *Apites*.
[p] Sträus-Durckheim has four parts—*head*, *corslet* (prothorax), *thorax* (meso and metathorax), and *abdomen*.

meso- and *metathorax*, "*pectus.*" Sträus-Durckheim calls the *prothorax*, "*corselet*," and the other two segments the *thorax*. Lastly, MacLeay and Burmeister, following Andouin, consider the three segments perfectly distinct, and adopt for them the same names; yet these writers still seem to suppose some connexion between these segments, which essentially insulates them from the rest, and therefore apply to the three united the name of *thorax*. Beyond the nomenclature of these four segments, reckoning the head as one, nothing has been done yet in description; we find the second, third, fourth, &c. segment of the abdomen, constantly spoken of and described, without the slightest hint being given to us from which segment we are to commence counting.

Before entering more minutely into those variations of the thirteen segments on which subdivision will be found to depend, permit me to make a few observations on the preparatory and highly important state of *larva*. Every true insect must pass through this state previously to arriving at perfection; and as its habits are more slugglish, and its occupation (that of eating) more uniform, and as its life is usually confined to a single medium, and its movements to a single mode of progression, it seems evident that no one segment need be particularly enlarged or strengthened at the expense of the others: we find this not only theoretically, but positively the case; and, consequently, each of the thirteen segments is regularly and uniformly developed; and from this circumstance, and the splendid discoveries of insect anatomists, who have detected every part of the *imago* in the *larva*, in the very position, or nearly so, which it is destined eventually to occupy, it may, I think, without incurring a charge of theorizing, be taken for granted, that every segment of the *larva* still exists in the *imago*, although its presence, owing to the development of a neighbouring segment, may be in some instances somewhat difficult to detect. It would be a delightful task to trace each segment in its increase or decrease as it passed through the intermediate state of *pupa*, but this will scarcely be accomplished by a single individual, as the number of specimens to be examined, and the difficulty of obtaining sufficient specimens of all the classes, in each of the stages, would render the undertaking rather a laborious one. In order to show the uniformity of structure in *larvæ*, I have drawn a few outlines of those whose *imagines*

present the greatest differences; and, owing to the accurate and elegant manner in which my friend Mr. Ingall has engraved them, the reader will not fail to observe how beautifully simple and unvarying is the foundation on which nature builds structures so wonderfully and elegantly diversified; it seems as though a certain portion of matter were allotted, out of which she has to mould every variety of form.[q]

In naming the segments I have found two difficulties to contend with; *first*, the fear of introducing a new name where an old one had been pretty well established; *secondly*, the adoption of any name the meaning of which conveyed a false impression; these, however, I have not been altogether able to avoid without causing unnecessary inconvenience and confusion; your readers will therefore be kind enough to recollect that the six segments following the head are not named with any view to convey a sound and universally applicable meaning in their names, but to avoid any clashing with previous nomenclature: the remaining six, on the contrary, convey a meaning which I have endeavoured to render as simple as possible: the similarity in the meaning of the name given to the eleventh and twelfth segments will perhaps be pardoned when it is shewn that each in turn becomes the penultimate segment. In perusing these remarks, however, I could wish your readers to abstain from attempting to apply meanings, and to consider the whole as unmeaning words, the numerical situation being the only circumstance tending to illustrate the subject.[r]

The first segment of all insects is the CAPUT, or head, the hinder part of which generally forms a considerable portion of a sphere; the fore part is variously formed. On each side, immoveably fixed in it, and sometimes occupying the

[q] See Plate III. As the whole of the segments, in the perfect state, must be figured in the illustration of their parts, I thought it would be unnecessary to give figures of them here. "One of the most beautiful facts that the study of comparative anatomy presents us with, is the delight nature appears to take in working as it were with a given quantity of material, while she, nevertheless, produces an infinite variety of forms."—MACLEAY, *Zool. Journ. XVIII.*, p. 157.

[r] If in any instance I have introduced a new name where a previous name could possibly, I will not say properly, be retained, it has been entirely through negligence, and I shall be most willing to withdraw it when pointed out; for (in common I hope with all naturalists) I consider that the alteration of names once given is, of all scientific labours, the one most conducive to confusion and error, and one which no lover of science would intentionally commit.

greater portion of its lateral superficies, is an eye,[s] composed of an immense number of highly convex lenses; between these, which are termed *oculi*, and nearly on the crown of the head, are three simple eyes, called *ocelli*,[t] very minute, and each consisting of a single lens; these are generally placed in a triangle, and, like true eyes, are firmly fixed in the surface of the head. In front of the *ocelli*, between the *oculi*, and attached by a moveable articulation to the head, are the *antennæ*, or principal feelers. These are exceedingly various in size and form, which depend almost wholly either on the habits of the animals or on the development or situation of the eyes. In nocturnal insects, and those diurnal ones which have either small or very lateral eyes, the *antennæ* are always of great size, and in walking insects are carefully stretched forwards and used to touch and ascertain the surface before every step.[u] Those insects, on the contrary, which only fly in the brightest light, and which continue on the wing for a great length of time without alighting, have enormous eyes but very small *antennæ*.[x] Even in instances where the female in nocturnal insects is sedentary and less active than the male, the *antennæ* of the latter are so much the more developed that little similarity can be traced between them.[y] The mouth of insects at first sight appears rather complicated; it is composed of seven pieces, which may be readily understood by an analogical reference to the mouth of vertebrated animals—for instance, man himself—bearing in mind that the parts of the mouth in insects are to be considered and treated of as *bones*, the soft and fleshy parts being internal. Suppose the upper and under maxillary bones in man to be divided vertically down the centre, leaving the lips entire, then suppose additional muscles given to these jaws, so that they might move horizontally instead of

[s] Not always present, as in the instance of the *flea*, which has only simple eyes, or ocelli, a circumstance which renders its situation in a natural system very difficult to ascertain. As far as I recollect, this very obvious and highly important character has not been noticed by any of our writers on this singular animal.

[t] Not always present, nor uniform in number.

[u] Examples—*Phryganea*, *Carabus*, *Cerambyx*, *Formica*.

[x] Examples—*Syrphus*, *Libellula*.

[y] Examples—The Apterous females of Bombyces, and the slothful females of *Melolonthæ*; while the closely allied genera *Trichius* and *Cetonia*, both sexes of which fly by day, have small and similar *antennæ*.

vertically, we should then have an *upper lip*, a pair of *upper jaws*, a *tongue*, a pair of *lower jaws*, and an *under lip*, or, in entomological language, a *labrum*, two *mandibulæ*, a *lingua*, two *maxillæ*, and a *labium*, which parts are always present in the principal forms of every class, and in no insect yet discovered has any new or additional primary part been detected; nevertheless, there are epiphysal appendages, or secondary parts, called *palpi*, these are four or six in number,[z] and are articulated on the *maxillæ* and *labium*. The variations in the form of these constituent parts of the mouth have been used by Fabricius as the exclusive characters on which to found his classes, and perhaps are more sound and unobjectionable than any others taken singly.

In the first class, *Lepidoptera*, the *labrum* is scarcely distinguishable, the *labium* is distinct but short; it gives rise to two large, conspicuous, erect, or porrected *palpi*, between which are situated the *maxillæ*, which are in this class two long tubes, rolled up spirally when at rest, in the manner of the main-spring of a watch, but capable of being unrolled at will for the purpose of being inserted into the *corollæ* of flowers to extract their honey: the *lingua* and *mandibulæ* are nearly obsolete, and take no part in the functions of manducation. This mouth is termed *antliate* by Kirby. In the second class, *Diptera*, the *labrum* and *labium* combine in forming a stiff hollow cylinder, in which are contained the *mandibulæ*, *maxillæ*, and *lingua*; these are excessively sharp-pointed, and are thrust by the animal into substances (as leaves, fruit, flesh, &c.) for the purpose of making an incision, through which the fluid portion (as sap, juice, blood, &c.) may flow into the cylinder, formed by the united lips, which, by the creation of a vacuum on the plan of a syphon, conveys the juice through the *œsophagus* into the stomach. This mouth is termed *proboscidate* by Kirby. In the third class, *Hymenoptera*, the *labrum*, *mandibulæ*, *maxillæ*, *lingua*, and *labium*, are all fully developed; the office and appearance of the *mandibulæ* and *maxillæ* are now changed, acting neither as suckers nor lancets, but being hard, strong, horny jaws, eminently adapted to gnawing and detrition of hard and solid substances, of which office, in the preceding classes, they are

[z] Epiphysal parts vary in number, constituent primary parts never.

incapable; the *lingua* is tubular, and particularly developed,[a] and, like the *maxillæ* in the first, and the *lips* in the second, serve for the imbibition of liquids. Kirby calls this mouth, in common with those of the fourth, fifth, and seventh classes, *perfect.* In the fourth class, *Coleoptera,* the *labrum, mandibulæ, maxillæ,* and *labium* are distinct and osseous, the *lingua* is generally small, often nearly obsolete; it frequently appears to be inserted in the *labium,* but I am inclined to believe it invariably originates farther back within the mouth, and, owing to its tenuity, needs this point of attachment. The *Coleoptera* both gnaw and swallow solid substances. In the fifth class, *Orthoptera,* the constituent parts of the mouth are all fully developed and osseous, as in the last class, excepting the *lingua,* which is larger, more fleshy, and, in one of the orders, somewhat tubular. In the sixth class, *Hemiptera,* the *labrum, mandibulæ, maxillæ,* and *labium* are again attenuated and elongated, and, with the exception of the *labrum,* which is free, united and formed into a jointed sucker, of which the *lingua* occupies (as far as I have been able to ascertain) the centre, and is thence darted out in the manner of a lancet into any substance the juices of which the insect wishes to extract. The insects of this class live entirely by suction. Kirby calls this mouth *Promuscidate.* Here you will observe I have arrived at a kind of mouth very nearly resembling that with which I commenced. The seventh class, *Neuroptera,* has no uniform structure of parts, but varies as its contents resemble those of the other classes, consequently, neither to the constituent parts of the mouth nor the variations of the segments of the trunk can be assigned any common character.

The second segment of an insect is the PROTHORAX; it is the most important segment, for its variations, combined with those of the mouth above given, will at once determine to what class an insect belongs; and here allow me to observe, that the variations in the development of this and the adjoining segments is closely dependent on the functions which the

[a] In some of the orders, as the bees, the *mandibulæ* are free and corneous, while the *maxillæ* are pliable, and unite with the *lingua* in extracting the nectar of flowers. The mouth in Hymenoptera is so various, that the above definition is of but little value, except as subject to further definition and qualification.

organs arising from them have to perform, and this not always directly, but relatively, as the functions of the organs which one segment may bear, frequently influence the next segment on either side in a greater degree than the segment more immediately concerned. The segment in question supports the *caput*, or head, and joins at its opposite margin the *mesothorax*, being articulated to both by a perfectly free joint, moveable in any direction: it bears also the *propedes*, or fore-legs, which are articulated to it with perfectly free joints, and which have generally a tendency to stretch forward.' In *Lepidoptera*, the *prothorax* is a narrow ring, or circular collar, on which the scales are generally more erect than on the *mesothorax*, a circumstance which renders it easy to be seen externally, and without removing the scales; in the *Pterophori*, however, it is scarcely to be detected. In the *Diptera*, all external appearance of the prothorax (at least from above) has ceased,[b] the *caput* and *mesothorax* seem to be articulated together, and the fore-legs to spring from the joint which unites them; directly we leave the *Diptera* you will observe the *prothorax* reappearing among the bees, more prominent in the *Spheces*, and a very important segment in the genera *Sirex* and (particularly) *Cephus*:[c] these genera probably lead to the *Coleoptera*, in which the *prothorax* is remarkably conspicuous; but it is not until the next class, *Orthoptera*, that it attains its fullest development, where, especially among the *Grylli Bullæ* of Linnæus, it seems to have reached its maximum, being frequently of greater magnitude than all the remainder of the insect; in *Hemiptera* also we find the *prothorax* occasionally of prodigious relative magnitude, but it gradually decreases until, in *Cicada*, it has become a mere collar, and finally merges in the Lepidopterous form with which I commenced.[d]

[b] With some few exceptions.

[c] Also in the *Chalcides*, and above all in *Agaon*.

[d] If among your readers there should be some who wish to learn—which I fear there scarcely will be, as it is the infallible consequence of publishing in such a channel, to be read by those who know more on these subjects than oneself—if, I say, there be those who wish to learn, I will offer for their use a few very simple observations: I have already stated that the *prothorax* produces the fore-legs, the *mesothorax* the fore-wings and middle-legs, and the *metathorax* the hind-wings and hind-legs; if, therefore, an insect be accurately dissected, these parts will adhere to the segment to which they naturally belong. In order to try

The third segment is the MESOTHORAX: it is that prominent part in *Lepidoptera*, *Diptera*, and *Hymenoptera*, through which the entomologist usually passes the pin in specimens for his cabinet; it bears the fore-wings, and varies in development in accordance with the functions of those organs. In *Lepidoptera*, the fore-wings are large and powerful, and are the principal organs of flight; consequently, the *mesothorax* is robust, and in fact the most conspicuous segment of the thirteen. The *prothorax*, as we have seen, is small and unimportant, ruled by the mathematical law, that out of a given quantity of matter divided into portions, if one portion have more than its share, another must have less; and in insects, the increased segment or segments invariably diminish those immediately adjoining. In *Diptera* the fore-wings are the only organs of flight, the development of the muscles by which they are moved, and the space required for them, must consequently be great; accordingly we find the *mesothorax* at its maximum, and the *pro-* and *metathorax* at their minimum. In *Hymenoptera*, the hind-wing again becomes an organ of flight; consequently the equilibrium of parts begins to be restored, the *prothorax* reappears, and the *mesothorax* decreases in magnitude; it is still, however, the principal segment: as we approach the *Coleoptera*, the genera *Cephus* and *Sirex* present a smaller *mesothorax*, but as I have already pointed out, a larger *prothorax*. In *Coleoptera*, the fore-wings are not organs of flight, but merely osseous plates or shields to protect the organs of flight, which are the hind-wings only; accordingly its volume is very much reduced; its

this, and at the same time to gain a much more thorough knowledge of the subject than definitions or drawings can possibly give, let me recommend the inquirer to obtain some of the larger species of the principal orders in each class; for instance, *Papilio*, *Sphinx*, *Tipula*, *Tabanus*, *Bombus*, *Tenthredo*, *Sphex*, *Ichneumon*, *Meloë*, *Buprestis*, *Scarabæus*, *Silpha*, *Forficula*, *Gryllus*, *Acridium*, *Pentatoma*, *Notonecta*, *Cicada*, &c., and having thoroughly relaxed them by steeping in hot water, and afterwards dried them on blotting-paper, proceed to the task of carefully dividing each of them as far as practicable into their thirteen elementary parts; nature will point out the divisions, but it may require a little care to adhere closely to her guidings. The genus and class of each insect should be written down, and any observation that may occur noted at the time. The learned may smile at the idea of a beginner, like myself, attempting to instruct or offer advice on such points as these; let him however recollect that advice of this kind may be acceptable to some, and on the score of its possible utility, however limited, let him pardon the writer his presumption.

external appearance being confined to a small triangular plate which has its base situated against the hinder margin of the *prothorax*, and its sides against the osseous *proalæ:* in all descriptions of *Coleoptera* the *mesothorax* is termed *scutellum*. In *Orthoptera*, with the exception of the *Mantites*, the *mesothorax* has no external development when the wings are closed: it is here at its *minimum*. In *Hemiptera* it reappears as a triangular plate, similar to that called *scutellum* in *Coleoptera;* as we proceed through the class we find it increases in volume until, in *Cicada*, it has reached a magnitude and prominence closely resembling its appearance in *Lepidoptera*.

The fourth segment is the METATHORAX; it bears the *metalæ*, or hind-wings. In *Lepidoptera* the expansion of the hind-wings is considerable; and accordingly this segment is also very apparent. In *Diptera* the hind wings do not answer the purpose of flight, but have dwindled to mere pedunculated knobs, called *halteres*, or poisers; the *metathorax*, consequently, is very much diminished, and scarcely visible, being nearly concealed, especially in the *Muscæ*, by the enlargement of a portion of the *mesothorax*. In *Hymenoptera* it reappears conspicuously, and increases in volume as the hind-wings increase in expansion. In a small natural order of insects which are parasitical on bees (Genus *Stylops*), the *metathorax* is said to be very fully developed; but I have never yet possessed the means of examining one of these insects under a sufficiently high power to obtain any correct idea of its structure. From the elegant illustrations of *Elenchus Walkeri*, (Curtis,) and *Halictophagus Curtisii*, (Curtis,) it would appear that the epiphysal appendages which have been supposed analogous to the *proalæ* of *Coleoptera*, arise from the *prothorax* close to the insertion of the *propedes;* the same may be inferred from Kirby's definition, "Pseudelytera twisted attached to the fore-leg." Now, if this be the case, these appendages are not analogous to the *proalæ*, but are *processes* of the *prothorax*.[e] We see in the *Coleoptera* the cause of *metathoracic* development, viz. the bearing of the sole organs of flight; but in *Stylops*, &c. we find the wings on the next segment to that which

[e] "J'ai considéré ces organes comme des pièces analogues aux ptérygodes des Lepidoptères."—*Latreille. Cours d'Entomologie.* Tom. I. p. 242.

bears the *propedes*, consequently on the *mesothorax;* and its four divisions will then be the *præscutum*, *scutum*, *scutellum*, and *postscutellum* of the *mesothorax*, according to *Andouin's* nomenclature; the *metathorax* will probably be concealed, as in the *Muscæ;* and the nine posterior segments are found of uniform development, as in the *Tipulæ*. These conclusions would place *Stylops* very near the *Diptera*, a locality which a certain similarity of its head to that of *Myopa*, *Conops*, &c. would rather favour. So much from figures; as the greatest accuracy and care is required to avoid the destruction of such minute creatures in dissecting, errors may possibly have crept in; my motive for introducing a passing notice of *Stylops* in this place is, that should the part in question prove to be the *metathorax*, as has been hinted, then its natural station is the one which MacLeay has assigned it between *Hymenoptera* and *Coleoptera;* and, consequently, in passing from one of the classes to the other, it becomes compulsory to mention it. In *Coleoptera* the *metathorax* has reached a still greater development, and is nearly of equal dimensions with the *prothorax;* it is however entirely hidden under the *proalæ* when these are closed. In *Orthoptera*, particularly in some *Phasmæ*, the *metathorax* has reached its *maximum*. In *Hemiptera* it has much decreased, although still the principal organs of flight arise from it; at least this is the case in the *Cimicites;* but in the *Cicadites* the *proalæ* have resumed the full functions of flight; and, as I have already observed, the *mesothorax* is enlarged at the expense of the *pro-* and *metathorax*. The articulation of the *mesothorax* and *metathorax* is fixed.

The fifth segment is the PROPODEON, and is, of the whole thirteen, the most difficult to determine, because in orders of the same class it appears in different modes: in *Lepidoptera*, generally, I believe its external appearance is that of a narrow ring slightly incrassated in the middle, and assuming, when viewed from above, a somewhat bow-shaped figure. In *Cossus* it appears to me to be the part which Kirby calls the *metathorax*,[f] which I think it cannot be; as the *metalæ* are decidedly not attached to it. In *Pterophorus* it is very distinct, and varies scarcely at all from the following segment;

[f] Int. to Ent. Pl. IX. Fig. 1.

the same may be said of its appearance in the *Tipulæ;* but in *Musca* it is so completely anchylosed with the *metathorax* as scarcely to admit the possibility of drawing the boundaries of either. In *Hymenoptera* it also varies in the bees, wasps, *Spheces*, &c. It forms the anterior portion of what is commonly called the peduncle, and has been noticed by Latreille in some of the Hymenopterous parasites, the peduncle of which he considers as composed of two segments; and in MacLeay's figure of *Polistes*, I believe, the *postscutellum* (and perhaps *scutellum*) of the *metathorax*, are referable to it. In *Sirex* it is distinct and free. In *Coleoptera* it is always anchylosed to the *metathorax*. In *Orthoptera* it is always distinct. In most *Hemiptera* it is anchylosed to the *metathorax*, though distinct and free in *Cicada*; its articulation, however, to the *metathorax*, whether anchylosed or distinct, is always, as far as I have observed, perfectly immoveable.[g]

The PODEON, or peduncle, is the sixth segment. In *Lepidoptera* and *Tipula* it is rather of less circumference than the adjoining segments; its articulation with the neighbouring segment on each side is of the mixed kind. In the *Muscæ*, and the majority of the *Hymenoptera*, it is a mere tube connecting the incrassated parts of the insect, and its articulation to the *propodeon* is perfectly free and moveable. In the *Tenthredinites*, *Sirex*, and the *Coleoptera*, neither its articulation nor development differ from those of the following segments. The same may be said of its appearance in *Orthoptera* and *Hemiptera*, except that in the *Cimicites*, in common with the other segments, its articulation is almost or quite immoveable.

The *seventh* segment, METAPODEON, presents no remarkable character except in those *Diptera* and *Hymenoptera* in which the *podeon* is so remarkably restricted: in these its circumference anteriorly is not more than one-eighth of its circumference posteriorly.

The *eighth* segment, OCTOON, is remarkable for its immense development in the pedunculated insects above spoken of; the common hornet or wasp are good illustrations of this.

The ninth, tenth, and eleventh segments present but trifling variations, and these by no means confined to the classes.

[g] Great uncertainty exists on this subject, but the position of the spiracle is in favour of the supposition.

The twelfth segment, PARATELUM, becomes the terminal one in the females of all pedunculated, and some few other orders of insects.

The thirteenth segment, TELUM, is remarkable for its various apophysal and epiphysal appendages, for its containing the organs of generation and reproduction, and for its total absence, or perhaps conversion into some essential organs, in the females of pedunculated insects.

The principal variations will perhaps be more readily understood by a glance at the following table:

Maximum of CAPUT.[h]	IV. Coleoptera.	
2d Degree.	III. Hymenoptera.	V. Orthoptera.
3rd Degree.	II. Diptera.	VI. Hemiptera.
Minimum.	I. Lepidoptera.	
Maximum of PROTHORAX.	V. Orthoptera.	
2d Degree.	IV. Coleoptera.	VI. Hemiptera.
3rd Degree.	III. Hymenoptera.	I. Lepidoptera.
Minimum.	II. Diptera.	
Maximum of MESOTHORAX.	II. Diptera.	
2d Degree.	I. Lepidoptera.	III. Hymenoptera.
3rd Degree.	VI. Hemiptera.	IV. Coleoptera.
Minimum.	V. Orthoptera.	
Maximum of METATHORAX.	V. Orthoptera.	
2d Degree.	IV. Coleoptera.	VI. Hemiptera.
3rd Degree.	III. Hymenoptera.	I. Lepidoptera.
Minimum.	II. Diptera.	

And here it is necessary that I conclude this letter, which has already extended to an unreasonable length; although, in the desire of intruding as little as possible on the pages of a magazine occupied by writers in every respect so much more worthy of them than myself, I have studiously suppressed

[h] By "*Maximum of Caput*" I mean more particularly to imply the full, perfect, and osseous development of the seven organs of manducation. By "*Minimum of Caput*" the entire absence of masticatory organs.

that mass of illustrations and collateral remarks, which seem completely to overwhelm one, when engaged on a subject like the present; and I have thus rendered my communication as bare and unadorned a detail as I could possibly accomplish consistent with clearness; but, as a repetition of the contents of this letter must be given in detail, as each segment comes to be reviewed separately, I feel the less regret at leaving it in its present very superficial and unfinished state, entreating your scientific readers to make every allowance for one who has had but little experience in these matters, and but little leisure to render that experience available.

The next letter will relate solely to the first segment or head of insects. I am, &c.

EDWARD NEWMAN.

Deptford, March 1, 1833.

ART. XLVII.—*Entomological Notes.* By EDWARD NEWMAN, Esq., F.L.S.

(*Continued from page* 288.)

CLASS.—LEPIDOPTERA.

NATURAL ORDER.—GEOMETRITES, *ined.*

GENUS.—NYSSIA. *Godart.*

Nyss. Tauaria. *Fusco-grisea; metathoracis margine anteriori, lineaque centrali longitudinali nigris.* ♂

General colour brown-gray; mesothorax with its anterior margin and a longitudinal central line forming together the letter T, black: fore-wings tawny-gray transversely and irregularly waved with dark brown; exterior margin with a wide irregular band of pale brown: ciliæ of the same colour, having a row of black dots internally: hind-wings pale brown with a black spot at the anal angle. (Length $\frac{6}{10}$ inch.; breadth $1\frac{1}{2}$ inch.)

Although the above description may probably suffice to distinguish this insect from its congeners, *N. hispidaria* and *N. pilosaria*, I will call the reader's attention to its superiority in size to the former of these, to the T on the mesothorax,

formed by the transverse and longitudinal black lines, to the broad pale margins of the fore-wings, and lastly to the time of its appearance, so different to that of either of the other species, it having been taken by my father at Leominster, in June, 1832, in a perfectly recent state, and had apparently never flown.

CLASS.—HYMENOPTERA.

NATURAL ORDER.—SIRECITES, *ined.*

GENUS.—SIREX.

Hujus quandoquidem generis descriptionem vix aptam invenies; integram, secundùm partium nomenclaturam novam attentavi; inde petens præterea eandem explicare. Sirecis, *maris* caput fere trigonum, anticè rotundatum, postice paullò convexum est; antennis multi-articulatis, capite ad apicem pedetentim attenuantibus; oculis parvis vix prominentibus; ocellis tribus in triangulo, cujus apex anticus, dispositis; labro elongato lateribus medio, convexis apice rotundato; mandibulis corneis, rigidis, tridentatis; lingua tenui vix conspicua; maxillis linguiformibus haud corneis, palpos duos minutos integros, ferentibus; labio fere trigono, angulis rotundatis, palpos duos triarticulatos, articulo ultimo longiore, ferente. Prothorax capite latior, anticè paullo ad capitem recipiendum, posticè valdè ad mesothoracem recipiendum, concavum, lateribus rectis; hinc medio valdè attenuato, lateribus latioribus. Mesothorax pyriformis, apice minori retrospiciente. Metathorax mesothorace minor, medio tenuissimo lateribus dilatatis. Propodeon, segmentaque sequentia usque ad telum clarè pariterque patefacta. Telum minutum, fere trigonum, apice acutissimo. Pedes mediocres; femoribus brevissimis, angulatis; protibiis, mesotibiisque curvatis, brevissimis; metatibiis longioribus, angulatis, dilatatis; tarsis quinque-articulatis, articulo primo longissimo, quarto brevissimo, quinto mediocre ungues duos, arcuatos, bidentatos ferente. Hujus generis neque proalæ, neque metalæ, neque articulorum antennarum numerus, characteres ad distinctionem pertinentes, sic mihi videtur, præbent; præterea distinctionis gratia segmentorum redundant figurationes.

Sirex nigricornis. Mas. *Antennæ* (20-*articulatæ*) *caput, prothorax, mesothorax, metathorax, propodeon, podeon, metapodeonis margo anterior, mediusque disci chalybeo-nigra: metapodeonis margo posterior lateribusque, octoon, ennaton, decaton, protelum, paratelumque ferruginea: telum chalybeo-ferrugineum: coxæ, trochanteresque nigra:*

femora ferruginea: protibiæ ferruginæ: mesotibiæ ferrugineæ, extus macula magna nigra: metatibiæ nigræ: protarsi ferruginei: mesotarsorum articuli 1us. 2us. 3^usque^. *nigri, ferrugineo contaminati;* 4us. 5^usque^. *ferruginei; metatarsorum articuli* 1us. 2us. 3^usque^. *nigri;* 4us. 5^usque^. *ferruginei: proalæ, metalæque croceo inquinatæ, marginibus fuscis.* (Long. corp. $1\frac{1}{4}$ unc.; Alar. dilat. 2 unc.)

Sirex nigricornis. *Fab. Ent. Syst.* Tom. II. p. 126.

In order to save trouble and avoid repetition, I have given the whole of the generic and specific characters in Latin, and each under a single head. A single specimen of the splendid insect described has been taken in Essex on the blossom of a Dahlia, and transmitted to me by my friend Christy: the colour of the twelfth segment and of the femora, besides three additional joints in the antennæ, distinguish it from *S. Juvencus.*

CLASS.—NEUROPTERA.

NATURAL ORDER.—PERLITES, *ined.*

GENUS.—ISOGENUS.[a] *Newman.*

Sexuum amborum alis pariter repandis, pariterque abdominem tegentibus; telo setis duabus instructo. Eâ descriptione *Perla*, hâc e *Nemoura* distinguebis: mox fusiorem conatus.

Perla . . . *Geoffroy Latreille.*
Phryganea . *Linnæus.*

Iso. nubecula. *Proalæ sordidæ hyalinæ, nubeculâ costali ultra medium fuscâ.*

Body dark brown; head and prothorax with a longitudinal ochreous line; fore-wings hyaline, slightly tinged with brown and having a little oval cloud of a darker brown colour on the costal margin situated about one-third of the distance from the tip towards the body: hind-wings beautifully hyaline, legs pale brown. (Length $\frac{6}{10}$ inch.; breadth $1\frac{1}{2}$ inch.)

This insect is abundant in the neighbourhood of running waters in Herefordshire, Worcestershire, Nottinghamshire, &c. and is the favourite food of trout and grayling. I cannot find that any author has described or named it.

[a] Ισος par, γένος sexus.

NATURAL ORDER.—LIBELLULITES, *ined.*
GENUS.—LIBELLULA. *Linnæus.*

Libel. prænubila. *Alæ omnes hyalinæ, nebulis duabus costam attingentibus; metalæ præterea prope basin, labe magnâ, fusco-nigrâ, ornatæ.*

Head brown with two yellow spots behind the eyes; body brown with five or six yellow spots more or less distinct on the sides, the hinder segments much broader and less pilose than in *L.* 4-*maculata*: to the stigma of the fore-wings is attached a rich brown cloud which frequently extends across the wing to the opposite margin; near the centre of the costal margin is another cloud of the same colour surrounding the spot which it possesses in common with *L.* 4-*maculata*; this cloud, however, does not extend across the wing to the lower margin: from this central cloud to the body the wing is beautifully stained with saffron colour: in these particulars the hind-wings perfectly agree, but have besides a large triangular dark brown blotch at their base as in *L.* 4-*maculata*: the legs are black and spiny. (Length 2 inch.; breadth 3 inch.)

Taken by my friends H. and E. Doubleday at Epping; it appears in abundance about a fortnight before *L.* 4-*maculata*, from which it differs in habit, flying over fields and about hedges, and never frequents water except for the purpose of laying its eggs, whereas *L.* 4-*maculata* confines its flight to the vicinity of ponds and waters. It has been considered as a variety by Vanderlinden and other authors, but the want of pilosity is a constant character; and this, together with the different habit, and beautiful though varied markings of the wings, I must consider entitles it to rank as a distinct species, more particularly as the difference between it and *L.* 4-*maculata* is most decided in specimens which have recently been transformed, and cannot therefore be the effect of age or detrition.

(To be continued.)

Art. XLVIII.—*Notice of Entomological Works.*

1. *Entomologisches Archiv. Heransgegeben von Dr. Theodor Thon. Erster und Zweiter Band. Mit Kupfertafeln. Jena,* 1827—1830.—These archives have but little original matter: they are principally useful in giving reviews of, and copious extracts from, other entomological works. In one number there is an interesting Monograph of the genus *Simulia*, with figures. Our limits will not permit us to enter into any details.

2. *E. F. Germar. Fauna Insectorum Europæ. Halæ sumtibus C. A. Rümmelii.*

3. *Deutschlands Insecten heransgegeben von Dr. G. W. F. Panzer—fortgesetzt von Dr. G. A. W. Herrich Schaeffer, &c.* —Both these works are continuations of Panzer. The first, which was formerly directed by Ahrens, contains twenty-five plates in each fascicle; of the second, there are about six numbers published, each containing twenty-four plates,—in the execution of the figures it is inferior to the first.

4. *Die Wanzenartigen Insecten. Erster Band. Drittes Heft. Viertes Heft.* 1832—1833.

5. *Die Arachniden. Erster Band. Zweites Heft. Drittes Heft.* 1832. *Getrell nach der Natur abgebildet und beschrieben von D. Carl. Wilh. Hahn. Mit sechs fein ausgemalten Tafeln. Nürnberg.* — The latter numbers of these two useful little works are quite equal to the former in point of execution and interest. In the third number of the Hemiptera are figured: 1. *Myrmus miriformis, Coreus miriformis* of Fallen. In the same plate is figured an insect which is considered only a variety of the preceding; it appears to be quite a distinct species, and to be identical with *Lygæus micropterus*, Burrell. 2. Two species of *Ophthalmicus;* the type of the genus is *Cimex grylloides* of Linnæus. 3. and 4. *Arma* and *Jalla*, two genera separated from *Pentatoma;* the types of which are *Cimex bidens* and *C. dumosa* of Linnæus. 5. *Rhynarius*, a genus very abundant both in number and species; we are surprised to see no more figured; its type is *Cimex sylvestris*, Linn. 6. Two new genera, *Halticus* and

Attus; their types, *Cicada aptera*, Linn., and *Lygæus pulicarius*, Fallen. Both these names are ill-chosen, too much resembling *Altica* and *Atta;* besides *Attus* is employed by some authors for a genus of spiders. In the fourth number are figured species of *Ælia*, *Capsus*, *Berytus*, *Pachymerus*, *Lopus*, and *Lygus*. The second number of the Arachniden contains figures of one species of *Mygale*, two of *Eresus*, and twelve of *Thomisus;* amongst them, *T. citreus*, one of the most beautiful of the British spiders. In the third number, two species of *Thomisus*, and seventeen of *Salticus*, are figured; most of them are inhabitants of Great Britain.

6. *Iconographie, &c. des Coléoptères d'Europe; par M. Le Comte Dejean, et M. Docteur J. A. Boisduval. Tome troisième.* 3me. *et* 4me. *Livraisons.* — We have just received two numbers of this work, containing figures of fifty-two species of the extensive group *Feronia*, which has been divided into many natural genera.

7. *Iconographie du Règne Animal de M. le B^n^. Cuvier, par M. F. E. Guérin.* 29me. *Livraison.* — This admirable work proceeds with unabated spirit. The present number has only two plates belonging to our department of Zoology; one of Crustacea, representing the genera *Nephrops*, *Astacus*, *Eryon*, and *Callianassa;* the other of Coleoptera, *Curculionidæ*, with figures of *Bruchus*, *Rhæbus*, *Anthribus*, *Attelabus*, *Rhinotia*, *Eurhinus*, *Brentus*, *Ceocephalus*, *Ulocerus*, and *Cylas*.

8. *Monographie des Cétoines, et Genres voisins, formant, dans les Familles Naturelles de Latreille, la division des Scarabées Mélitophiles; par M. H. Gory, et M. A. Percheron.* 1re. *Livraison*, 1833. — This, which we think ought rather to have been called a digraph, promises to be a useful work. It has been considerably delayed by the late events in France. We wish that all authors would show as much modesty as these do, in declining to publish new species named after them. In the Introduction there is a short account of the history and anatomy of the family; we then have a synoptic table of the genera. They are divided into three sections, which are called: 1. *Trichides;* 2. *Cétonides;*

3. *Gymnétides.* The new genera established are, *Strepsipher*, *Diplognatha*, *Amphitoros*, *Dicheros*, *Ichnestoma*, *Tetragonos*, and *Lomaptera*. We are glad to see that the authors give the derivations of these genera, a custom but seldom followed in this country. There is, besides, a diagnostic table of the species, giving a short description (comprising generally from one to two lines) of each species. We think this an excellent plan, as it often enables collectors to identify their species without wasting their time in wading through several volumes. We observe, that the lately-commenced practice of writing the names of persons to whom the species are dedicated, in the nominative case, is followed here. We thus have species named *Drummond*, *Brou*, *Hardwick*, *Hope*, *Germar*, *Brown*, *Cunningham*, *Desmarest*, *Dalman*, *Swainson*, *Macquart*, *Children*, *Petit*, *Barthélemy*, *Klug*, &c. &c. Of this we do not approve; it is decidedly at variance with all established laws of science.

This number is accompanied with seven plates, uncoloured, delineating all the genera, and the anatomy of *Cetonia*.

9. *The Nomenclature of British Insects, by James Francis Stephens, F. L. and Z. S. Second Edition.*—It is with much pleasure we find there has been a sufficient sale of this work to require the publication of a second edition. It is our duty rather to point out in what particulars this impression differs from the first than to notice it as an original work. The first remarkable difference is the numbering of the genera and species after Mr. Curtis's plan; and this is of great importance; but in our opinion the numbers ought to have corresponded exactly with those of the author's Systematic Catalogue, and new genera should have retained the number of the genus which immediately preceded each, and a letter might have been affixed to distinguish such genera. This is not an imaginary evil; for instance, we have often marked on little round pieces of writing-paper the numbers of the genus and species in Mr. Stephens's Systematic Catalogue, thus: S. 531. 1. a number which may now either mean *Euplectus Kirbii* or *Anax Imperator*; and, as we happen to have many insects marked in this way, much inconvenience will result. The second alteration is in the introduction of synonymes; this is a great improvement. The third alteration is the introduction

of a number of foreign *Ichneumones;* of this we entirely disapprove. The fourth alteration is in the printing of the genera in capital letters; this is too obvious an improvement for us to comment on. The present work only extends as far as the *Ichneumones;* the remainder is to be published in the autumn.

10. *Index Entomologicus, &c., by W. Wood, F. R. S., &c.,* No. I.—This is a pretty work, though any thing but what its name implies; disheartening, however, though the title certainly is, the work will be found a delightful one by all who take pleasure in the accuracy of pictorial design. The first number contains coloured figures of all the British butterflies; some of them, particularly *Lathonia, Atalanta, Cardui, Galathea,* and *Semele,* are to the life; all the others are good. The accuracy of the figures is the sole merit of the work; the arrangement is confused and jumbled in a strange manner; the names mis-spelt, as *Gompeteryx* for *Gonepteryx, Asis* for *Acis, Acteon* for *Actæon,* &c. &c.; and the letter-press so like Miss Jermyn's, that, did not Mr. Wood omit to notice that lady's work *in toto,* we should have almost been inclined to suppose he had borrowed a hint or two from it. For instance:

Miss Jermyn.	Mr. Wood.
Napi. Green-veined White. Gardens, Woods, and Thickets; middle of May; beginning of June.	Napi. Green-veined White. Gardens, Woods, and Thickets; May to July.
Cardamines. Orange tip. Woods and Lanes, Helmington, Suffolk; Dartmoor, Devonshire; end of May.	Cardamines. Orange tip. Woods and Lanes; Suffolk and Devonshire; end of May.
Atalanta. Red Admiral. Woods, Hedges and Gardens, neighbourhood of Dartmoor, Devonshire; Spring; middle of July; beginning of August.	Atalanta. Red Admiral. Woods, &c.; Devonshire; June and July.
Hyperanthus. Ringlet. Woods, neighbourhood of Dartmoor, Devonshire; end of June.	Hyperanthus. Ringlet. Woods; Devonshire; end of June.

Now Mr. Wood could not have taken a shilling ride out of London, in any direction, without seeing all these butterflies; and it is very singular he should have hit on the only *habitat* and time which Miss Jermyn gives,—particularly as Miss Jermyn's times of appearance, as well as localities, happen frequently to be very far from correct. Mr. Wood's known science protects him from the charge of plagiarism!

Art. XLIX. — *Varieties.*

43. *Preservation of Crustacea,* (Vid. ante, p. 312)— Sir, I with pleasure attend to the request made in the last number of the Entomological Magazine, and send you a brief account of the mode I have hitherto practised in preserving *Crustacea ;* but without presuming that it is better than other methods which are described in Taxidermy, or the several manuals on preserving generally which have been published by Mr. Bullock, Mr. Swainson, Mr. Samouelle, or Captain Brown. When collecting *Crustacea* I provide myself with a wide-mouthed bottle, or small jar, half filled with a mixture of equal quantities of spirit of wine and water; into this mixture the living specimens are plunged; and when the vessel is full and corked down the whole contents will bear carriage without injury. To dry specimens for the cabinet, when at home, it is only necessary with those of small size to fix them on the setting-board, separating and pinning out the parts of the tail, legs, antennæ, &c., and exposing them to a current of air. With larger specimens, of the size of prawns or crawfish, the body should be separated from the tail, and the soft parts from the inside of each half picked out from the orifice. Roll up a small piece of writing paper to a size rather less than that of the body of the specimen, and about half its whole length; spread a thin coat of gum dissolved in water over one-half of this cylinder of paper, and pass it into the body, the paper tube unfolds sufficiently to bring it in contact with the shell all round; gum the outer half, and upon that slide the tail, putting a small portion of gum on the outer circular edge of the tail to fix it in its natural situation inside the edge of the body. Fix the whole to the corked board by a pin through the body, setting out the tail, &c., and in a few days it may be removed to the cabinet without danger of separation or fracture. Crabs of two inches diameter and upwards should have the lower portion carefully detached from the upper shell, and all the soft parts removed from the inside of both, replacing and refixing the two parts by gum at all the points of contact. The advantages of the previous soaking in the spirit mixture

appear to be various. The specimens are more portable in bottles or jars, and are less liable to fracture than when dried on the coast. When required for the cabinet, no moisture or other inconvenience arises from saline matter. The soft parts left within the shell being saturated with spirit dry up with little unpleasant smell and no decomposition. The membranous parts are preserved and rendered tough.

Very small and delicate specimens may be conveniently preserved and examined in the long narrow test-tubes used by chemists, a small quantity of the spirit mixture before mentioned being added to each, and separating the specimens by a small slice of a phial cork. Five or six examples may be thus packed in a tube of as many inches. By wrapping up each specimen in a small piece of linen cloth, and tying it round with thread before placing it in the bottle or jar, the most delicate fish may be conveyed any distance without injury to the scales or fins. The same precaution would insure additional security with rare specimens of *Crustacea*.

I am, Sir, yours, &c.

WILLIAM YARRELL.

Ryder Street, St. James's.

44. *Habit of Microsetia ruficapitella.*—SIR, It has no doubt been observed by many, that in autumn the leaves of the rose-tree, on their upper surfaces, are very often marked in various directions with broad brown lines, having a narrow black one running down the middle. This curious appearance is caused by the small caterpillar of a minute moth (*Microsetia*, Steph.) which feeds inside the leaf. When full grown, the caterpillar is nearly two lines long, of a yellow orange colour, with a brown mark down the back, the head very flat, and sharp, and light chocolate. In this little caterpillar, the pectoral legs, instead of being pointed and corneous, as in other Lepidopterous larvæ, are soft and fleshy, gradually narrowing from the base to the apex, which is truncate and broad. It has likewise the power of drawing them entirely within itself, which it invariably does every time it raises the fore part of its body, drawing them in and pushing them out in regular succession, beginning with the third pair, or those farthest from the head. Their peculiar conformation, also, enables it

to support itself, and walk on these alone, with the rest of its body elevated perpendicularly. The caterpillar is very plump, and this formation of the legs enables it to take up less room in the leaf; for, notwithstanding its size, it eats only half the thickness of the pulp, and, until it is full grown, they are never entirely pushed out; for, when taken from its mine before this time, they cannot at first be distinguished.

The brown mark on the leaf is caused by the epidermis drying, from the insect having eaten the parenchyma, or substance of the leaf beneath; — the black one by its egesta, which, during its young state, entirely stop up the mine. I first observed this insect in our garden the beginning of last October, when it was very abundant, particularly on a large standard tree, which had almost every leaf mined by one or more of these caterpillars; for several often mine in one leaf, frequently crossing their own paths and those of others. When full grown, which is about the 24th October, it eats out of the leaf, and crawls down the branches and stem, until it has found a convenient place to fix its cocoon. This is the only time when it finds it necessary to make use of its legs, which seldom exceeds an hour, sometimes less. After having found a suitable place, which is generally about the spines and offsets of the branches, it begins to form its cocoon, by stretching out its body and attaching a thread to the branch; it then crosses its body to the other side, and there fastens it. By proceeding thus on all sides, keeping the hinder part of the body fixed, it forms the upper part of the cocoon, or that exposed to the weather, which is convex, and generally circular; the under part is oblong, shaped to hold the pupa, and much smaller than the upper, which projects considerably beyond it on all sides. At one end the threads are not interwoven, and leave a space through which the pupa can force a passage. This remarkable cocoon is very flat, and at first of a pure white, which is changed by the first shower of rain to light orange; it afterwards becomes of a deep brown, so nearly resembling the bark of the rose-tree as only to be distinguished by a practised eye. This change takes place very rapidly. When kept dry, the cocoon remained perfectly white, and produced the moth at the usual time, as well as one which had been immersed in water for twenty-four hours. The pupa is light brown, of an oval shape, about a line long, and half that

in breadth. Those kept during the winter, at the temperature of 60° Fahrenheit, produced perfect insects on the 20th April, those in the open air about three weeks later. The moth is the Red-headed Pigmy, *Tinea ruficapitella* of Haworth.[a] The upper wings are gold-coloured, with the apex purple; the head ferruginous: the expansion of the wings $2\frac{3}{4}$ lines.

I am, Sir, yours, &c.

EVAN WEBSTER LEWIS.

20, *Queen Street, King's Road, Chelsea,*
30th May, 1833.

45. *Defence of Mr. Westwood's Conduct*, (Vid. ante, p. 260.)—SIR, I am sorry my last communication should have been so negligently expressed as to have drawn from you observations creditable to your liberal feeling, but I apprehend less than fair towards a fellow-labourer. I did not contemplate the covert allusion you have supposed, having no reason to attribute to Mr. Westwood a knowledge of the intimated identity of the doubly-named groups; indeed, I consider that gentleman's zeal in the cultivation of science a guarantee against his knowingly encumbering our already teeming nomenclature with discarded names. Individually I was interested in few of the cases alluded to, and entertained no idea of property in mere indications. It is unfortunate that in the present state of system the introduction of such is unavoidable in a general classified catalogue, as those of Curtis and Stephens: in these instances, however, the resulting inconvenience may be obviated (to the entomologists of the metropolis) by a direct reference to collections which the liberality of their possessors has made almost public. In other cases the publication of detached indications is a fertile source of confusion; it so often happens they are suffered by their sponsors to remain barely such, whether from indolence, alien occupation, or the want of an appropriate channel for descriptive essays. This last difficulty being now happily removed by the liberal management of your magazine (*esto perpetua!*), it is to be hoped that all such pledges will in future be speedily redeemed.

Yours, &c.

A. H. HALIDAY.

Dublin, May 6th.

[a] Lep. Brit. p. 586.

Fig 1.

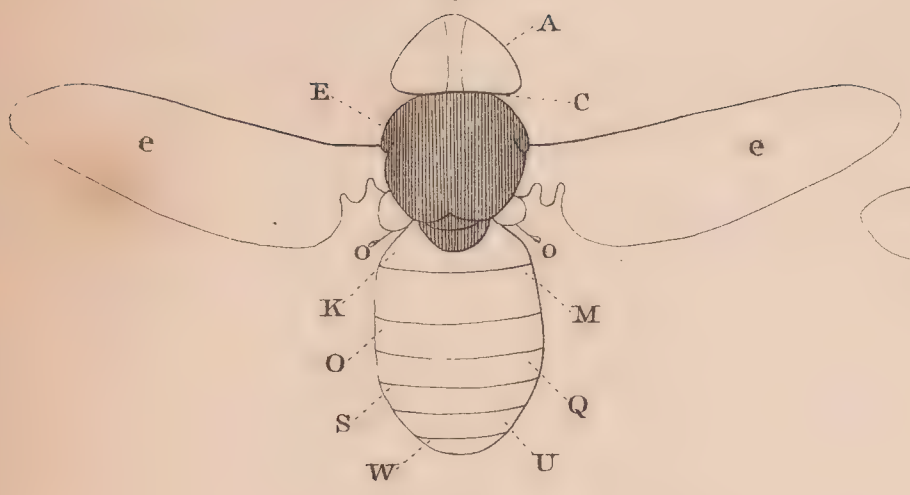


Fig 6.

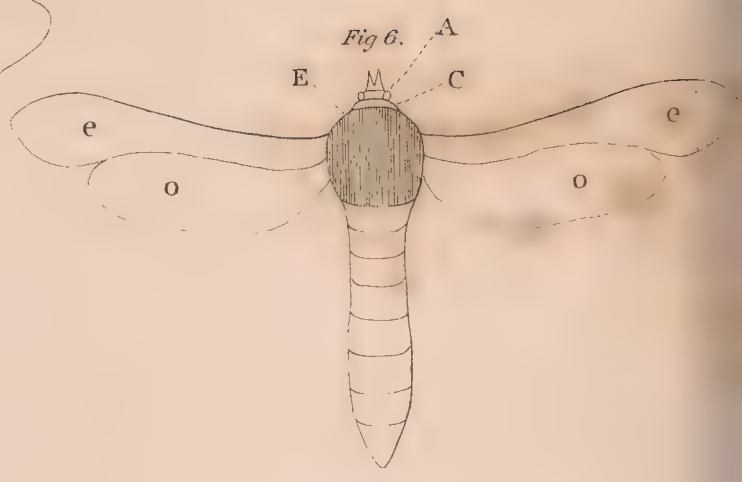


Fig 2.

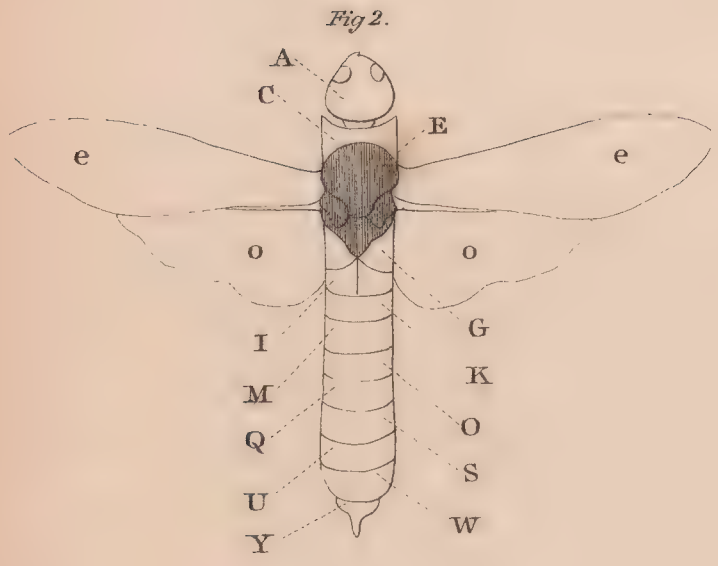


Fig 5.

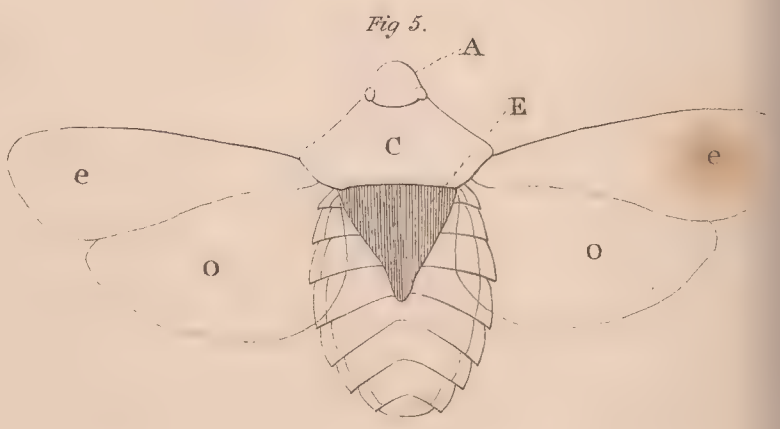


Fig 3.

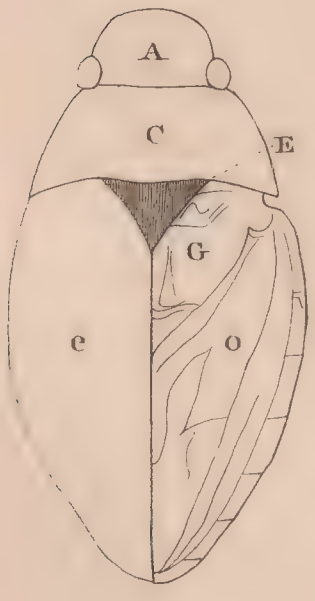
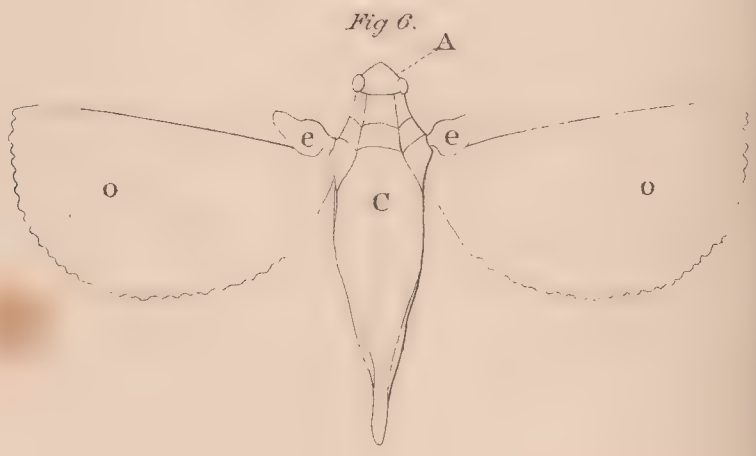


Fig 6.



THE

ENTOMOLOGICAL MAGAZINE.

OCTOBER, 1833.

Art. L. *Observations on Blight.* By Rusticus, *of Godalming.*

[Epistle V. and last.]

Who has not noticed the white-thorn hedges stripped of their leaves, and the twigs matted together with a web? and who has not heard the appearance attributed to east-wind and to blight? The blight is nothing more than the caterpillar of a small moth, which lays its eggs on the twigs the year before. When these eggs first burst the shell, the little caterpillars, which come out of them, spin themselves a nice silken house, taking care to enclose two or three leaves; as soon as these leaves are devoured, for which purpose they are inclosed, the house is enlarged, and made to include other leaves; these, in turn, are devoured, and others inclosed, till a mass of web is formed as big as one's hand. These masses are often so abundant as to touch one another; and the whole hedge looks as though it were dead, not a leaf being visible. The caterpillar is a little blue-black fellow, with a row of jet-black spots down each side; and when you hunt him out of his web, he wriggles away backwards and drops, spinning a thread as he falls, by which he hangs with all the ease of a spider; but there is this difference, the caterpillar spins his thread from his mouth, the spider from his tail. When full fed, the caterpillars fasten themselves by their hind legs to a part of their web, and, hanging with the head downwards, turn into chrysalises, —I have often found dozens hanging together in a line like rabbits on a pole. At the end of June the moth appears: it is a pretty little creature, having wings of a leaden ground-

colour, with jet-black spots, but varies, some specimens having a pure white ground.[a] Last year our hedges about Farncomb were swarming with them.

A larger moth, with a yellow tail and snow-white body and wings, is also very destructive to white-thorn hedges; but its proceedings have already been so accurately told, that I will not repeat them. This moth is appropriately called the "yellow-tail."[b] A kind very similar in its ways to the little ermine-moth inhabits the oaks, and sometimes in such swarms as to consume every leaf, and encase all the twigs in a continuous web for hundreds of acres: I have noticed this in Surrey and Sussex on three occasions, and once in part of Shropshire and Herefordshire. In the July of 1831 the oak-woods about Downton, the residence of Mr. Knight, the celebrated horticulturist, were as completely bare as on Christmas-day, and had a most unnatural appearance; the season was rather late, and the moth was then in the chrysalis, as I ascertained by climbing up some of the trees and shaking down whole showers of them. Early in the year the caterpillars may be seen, when the sun is warm, hanging by their little threads from all parts of almost every oak-tree, swinging to and fro with the least breath of air, like a lot of pendulums, each varying in time according to the length of its thread, which acts as the rod, and each occasionally giving itself a twirl like a slack-rope dancer, in the overflowing joy and happiness of its little heart. Each turns to a black chrysalis; and in ten days afterwards to a beautiful—yes, exceedingly beautiful, pea-green, bell-shaped little moth,[c] but too common to be valued for its beauty. When the moth is on the wing the oaks again clothe themselves with all the fresh green of spring, and the woods once more throw off their wintry looks.

The Lackey-moth,[d] another web-maker, is a great nuisance in our gardens, though but little known in our woods and forests. Our apple and pear-trees in this neighbourhood are webbed by it every year; the eggs are glued together into a ring round a twig, and if the twig be cut off, and the eggs killed by steeping in strong brine, may be kept for years without injury; in a natural state they hatch in May, and begin

[a] *Yponomeuta padella.*—Ed.
[b] *Porthesia chrysorrhœa.*—Ed.
[c] *Tortrix viridana.*—Ed.
[d] *Clisiocampa neustria.*—Ed.

spinning their web at once; in this they live till their second change of skin; after which they wander from each other, straggling all over the tree;—they now no longer spin, but each plies away at a separate leaf as hard as he can. The caterpillar, when full fed, is very beautiful, being striped lengthwise down the back with blue, red, black, and white. It spins a loose, oblong cocoon, about three-quarters of an inch long, which is covered inside and out with a golden dust, just like the pollen of flowers. These cocoons may be found every July, stuck against palings, walls, trunks of trees, on leaves, &c., in the most conspicuous situations; and the greater part of the chrysalises which they contain becomes the prey of the sparrow and the tom-tit.

In all these cases it is very difficult to suggest any remedy; but Nature has means of her own; the effects of which we may witness every day, though we must ever remain in ignorance of the acting causes; thus, after a year in which either of these insects may have abounded in hosts like locusts, so as almost to strip from Earth's face her beauteous veil of green, the following year not one of the kind has been seen, and the breed is barely continued by some pair of straggling individuals, to swarm again at the appointed time: but, though we cannot deal effectually and certainly with these insect-wasters, yet a good deal may be done by a little care, especially in gardens;—smoke, made by burning weeds at the time a moth is laying eggs, drives it away, and thus affords a local cure; the webs also, by a careful gardener, may be picked off and burnt when the caterpillars are young and clustered together; and thus, in gardens, the vegetation may be completely saved.

The jumping weevil,[e] which I alluded to in my last as infesting the beech-trees, is a very impotent enemy; it attacks the leaves just as they are preparing to open, and, whilst still unfolded, drills little holes through them, so that when fully open they look as though they had been shot at. The elm feeds another beetle of the same tribe, but of a brown colour, spotted with black; it is often called the elm-flea, from its being a most excellent leaper. These leaf-eating beetles are scarcely worth notice, as an injury; but there are other beetles, scarcely bigger than these, whose visit to a tree is death,—

[e] *Orchestes Fagi.*—Ed.

certain and inevitable death;—and I have been sorry to observe, whilst staying a few days in London, that its increase, particularly among elm-trees, is so rapid, that in thirty years' time, if its devastations continue, there will not be an elm left standing any where round the metropolis. In Kensington Gardens, Hyde Park, and St. James's Park, the elms are beginning to feel its power, but to the south of the city its ravages are frightful. In Greenwich Park the noblest trees are dying every year, and Camberwell Grove has nearly ceased to be a grove. The beetle[f] is brownish black, and in shape something like the great dung-chafer,[g] but is not more than an eighth of an inch in length; the females may be seen flying round the stems of the finest elm-trees in the sun-shine, like little bees. Where this is once seen the tree may as well be cut down, and the timber saved, for in two years the tree will be dead, and the timber good for little or nothing. Each female beetle bores a hole through the bark directly to the solid wood, and there deposits a cluster of from twenty to forty eggs; these hatch, and become little white maggots, which, by common consent, diverge like rays from the centre of a circle, and feed on the bark just where it touches the solid wood; guided by a singular instinct, they never cross each other's tracks, but go straight forward, without turning right or left; thus all connexion between the bark and the wood of the tree is destroyed, and their mutual offices lost to each;—the death of the tree is the sure and natural consequence. When each maggot has gnawed himself a gully about three inches long, he stops, turns to a chrysalis, then to a beetle, then gnaws a straight hole through the bark, comes out, and flies away in quest of a partner. The fir has a beetle very similar, peculiar to itself; it is quite black, rather longer, and much narrower.[h]

Now, as these little rogues breed by millions in a tree which they have once attacked, and much prefer them to fresh vigorous trees, I would recommend all owners of such property to cut down any tree directly he perceives, by the round shot-holes in the bark, that the attack has been commenced; convert the timber and burn the bark: this done in winter, when all are quietly housed in the bark, and no stragglers are

[f] *Scolytus destructor.*—Ed. [g] *Geotrupes stercorarius.*—Ed.
[h] *Hylurgus piniperda.*—Ed.

flying about for their recreation, would so thoroughly check their increase, that in a few years the insect would scarcely be known; and this might be effected without the destruction of a single tree, but those on which the beetles had already past their irrevocable sentence of death.

Here end my Observations on Blight; and now a word or two on things in general. I have more than once seen posted on a placard, at a shop window, "No connexion with the concern next door." I am compelled to take a hint from these worthies, and stick up, as a notice, "No connexion with the Rusticus of the Colloquia." I don't know that that Rusticus, or rather that adumbration of Rusticus, is made to say one word that is not strictly true; but this I know, that I cannot relate such things as an eye-witness, because I have never set foot on the soil of Africa, Switzerland, Germany, or Russia; and the Rusticus of the Colloquia appears perfectly familiar with all those countries. You will see I attach some importance to this matter, because on the veracity of my communications their sole value must depend; and were I once detected launching my pen into the sea of romance, that veracity might justly be called in question; after this explanation, your readers will be kind enough to draw a line between what Rusticus says for himself and what others say for him; and, with this understanding, I assure you no one will read the Colloquia with more pleasure than myself.

In the second place, a correspondent of yours, at p. 363, has, I perceive, given me a hint about what I said at p. 220, touching the antennæ of insects, for which I thank your correspondent, for it gives me an opportunity of requesting you to correct a printer's error; for *compilations* read *compilation*—you will see by the text *one compilation* only is referred to—pray put this in your *blunderata*. After thus duly thanking your correspondent for the kind and tender interest he seems to take in my writings, I should be acting rather unfairly towards your correspondent, if I were not to do a little in the same way for him; one good turn, you know, deserves another; and, as I suppose we are on a level in the matter of nameology, each having adopted a rural designation, we can the more freely discuss these little matters, each sheltering himself from the amicable weapons of the other under his own temporary shield. I will, therefore, in a brotherly manner, recom-

mend your correspondent, before he puts pen to paper, to consider whether he has anything to write about or not; and should he find that he is only writing for the sake of seeing his assumed name in print, I would advise him to wait till he has a worthier object; perhaps it is my excessive dulness, but for the life of me I can't make out what he means, it is for all the world like a young walnut—all bitter husk; yet his reader is always buoyed up by reference or promise; he

"Never is, but always to be blest."

Your correspondent has no present tense; the burden of his song is ever the same, of the *all* he has done, or the *all* he is going to do. Now I don't say that your correspondent makes too much of his labours; the *all* he has done I dare say is stupendous! folios and quartos innumerable! the *all* he is going to do, incredible! there must be quite a stir in the manufactories of paper, steel-pens, and ink, in consequence of his announcements. I do not pretend to say your correspondent overrates his labours, but I wish to remind him that this crabbed ill-natured world never takes a man at his own valuation; 'tis very perplexing, sour, ill-judged, and stupid of the world, I own; but in reply to all our boastings, the old lady sticks her arms a-kimbo, and laughs in our faces, allowing us to trumpet away as much as we please, and delight ourselves with sounds of our own making. I know your correspondent will take my remarks in good part, as I do his. "Nous devons de la reconnoissance à tous ceux que nous disent nos vérités."

Thirdly. I have observed that Mr. Loudon, Vol. VI. p. 261, has given you a most friendly jog of the elbow about the line which is left blank between each of your "Varieties:" —"*widely enough detached as to typography*," says Mr. Loudon, thereby implying,—oh, the facetious fellow!—that we, your readers, are entitled to have letter-press instead of a blank space: he is very right in thus insisting on a reader's having as much as possible for his money, and I recommend you forthwith to adopt the course he points out of printing close. Mr. Loudon's remark, at first reading, perhaps appears a little too pungent; but editors are sad hands at screwing their readers out of a little bit wherever they can; even Mr. Loudon himself has slipped, quite unintentionally, no doubt,

into a little error of the same kind: his first number of the Magazine of Natural History contains 44 pages of small type, equal to 66 pages of large, and 41 wood cuts; the number of pages of small type have decreased to *none at all*, and of wood cuts to 13, which makes a difference to the subscriber of about 22 pages of letter-press and 28 wood cuts in each number. Every body must see at once that this has happened merely from some oversight, for Mr. Loudon has been so overwhelmed with communications that he has seriously considered of the necessity of publishing the Magazine monthly. This little alteration in Mr. Loudon's plan makes no difference whatever in his excessive kindness in pointing out your little peccadilloes, a kindness which I hope you will allow me the use of your pages thus to return; my age entitles me to act as a kind of Mentor to both of you; and you well know that "plus les instituteurs aiment leurs élèves, plus ils sont attentifs à les reprendre de leur fautes."

You will think that I have become very talkative, but the truth is I do love a bit of gossip, and it will be a long time before I have another opportunity: your Fire-fly will ever have my best wishes; in the words of your worthy and classical correspondent, Mr. Haliday, *Esto perpetua!* I don't know how it is, but the farewell seems to stick in my throat, or rather on my pen,—I have contracted a kind of friendship for your readers which makes it hard to say—farewell; so I'll skip it. Inclosed is a packet of memoranda on all manner of subjects—the other end of the trip to the Isle of Wight that Loudon published part of—something about wire-worms, and crane-flies, and summer-birds, and tortoises, and bees, and ants,—a rare medley; you may pick out what you like and put in the Fire-fly, when crack-jaw runs short with you; there are also a good many pen-and-ink sketches illustrative of the subjects.

Towards the end of 1834, Rusticus may be again in England; and, if his name has not passed from the memory of your readers, he may perhaps once more address you; but that time is too far a-head of us to make much calculation about it now.

Interia classem velis aptare jubebat
Anchises, fieret vento mora ne qua ferenti.

Yours, &c. RUSTICUS.

London, 2d July, 1833.

Art. LI.—*Entomological Sapphics.* By Rusticus, *of Godalming.*

[*Note.*—The MS. alluded to by our correspondent in the preceding article is headed "Log, 13th May, 1801." We intended on receiving the "Log" to have published it as it stood, making such few alterations as might appear absolutely necessary; but we find it will be more convenient to arrange the matter a little, and *dele* some occasional detail which might not be thought altogether adapted to our pages; we must therefore give editorial headings and notes occasionally, and omit those of the author: such editorial additions will be enclosed in brackets. The dates of the following *Sapphics* are very various, extending from 1812 to 1832.—Ed.]

[No. I.—The Butterfly. *Translated from the Persian.*]

Late as I wandered o'er a verdant meadow,
Hairy and loathsome creatures were devouring
Every leaf that tempted with its greenness,
Or by its fragrance.

Great was their toiling, earnest their contention,
Piercing their hunger, savage their dissension,
Selfish their striving, hideous their bearing,
Noisome their figure.

Next day[a] I wandered to the verdant meadow,
Each worm was spinning for himself a mantle,
It was his grave-shroud, and I watched him closely
Wrap it around him.

Once more I wandered by the verdant meadow,
Each worm was bursting from his long confinement,
Each one was spreading to the sun's bright beaming
Quivering pinions.

Hued like a rainbow, sparkling as a dew-drop,
Glitt'ring as gold, and lively as a swallow,
Each left his grave-shroud, and in rapture winged him
Up to the heavens.

Oh then shall man, on earth condemned to trouble,
Toilsome existence, warfare with his kindred,
Build for himself his last cold habitation,
Doomed to remain there?

[a] "On the morrow" in the Persian,—it would not Sapphicise.

No! like these creatures, trouble, toil, and prison,
Chequer his pathway to a bright hereafter,
When he shall mount him to the happy regions,
Made to receive him.

[No. II.—The Firefly. *Translated from the Arabic.*]

After the sun has sunk into the ocean
Thou dost awaken from thy daylight slumber;
Night is the season for thy lamp to glisten,
It is thy day-time.

So will I leave to those who love his scorching,
Day's ardent ruler, and when night approaches,
Offer my homage to the moon's pale glances,
And the sea perfume.[b]

[No. III.—The Cicada. *Translated from the Greek of Anacreon.*]

Happy Cicada, perched on lofty branches
Deep in the forest, cheerful as a monarch,
Tasting the dew-drops, making all the mountains
Echo thy chirping—

Thine is each treasure that the earth produces;
Thine is the freshness of each field and forest;
Thine are the fruits, and thine are all the flowers
Balmy spring scatters.

Husbandmen fondly doat upon thy friendship,
Knowing thee guiltless of a thought to harm them;
Thee mortals honour, sweet and tuneful songster,
Prophet of summer.

Thee, all the muses hail a kindred being;
Thee, great Apollo owns a dear companion;
Oh, it was he who gave that note of gladness,
Wearisome, never.

Song-skilful, earth-born, mirth and music-loving,
Fairy-like being, free from age and suff'ring,
Passionless, and pure from this earth's defilement,
Almost a spirit.

[No. IV.—The Cicada. *Translated from the Greek.*]

Drunk with the dew-drop, perched on twig so lofty,
Noisy Cicada, o'er the wild waste sounding,
Saw-like the feet which to thy side thou pressest,
Drawing sweet music.

[b] The breeze from the Red Sea blows nightly inland, and is loaded with the scent of musk, roses, and a variety of spices.—Ed.

Try then, my beauty, tune another measure,
Pan shall return thy labours with an echo;
Here, 'neath the plane-tree, all my love forgetting,
Woo me to slumber.

[No. V.—The Cicada. *Translated from the Greek.*]

Wandering once, I saw a spider weaving
Lithesome [c] his meshes, and a poor Cicada,
Struggling captive in the filmy network,
Chirped for his freedom.

Quickly I hastened to the child, song-loving;
Quickly I loosed him from the fearful durance;
"Fly, then," said I, "with liberty I pay thee
"For thy sweet music."

Art. LII.—*Exposure of the Fallacy of the Septenary System in Natural History.*

Sir,—Little did I imagine that I should ever again enter the field of disputation in matters of physical relation; but extraordinary circumstances demand extraordinary exertions; and unwilling as I feel to appear again before the public—unaccustomed as I am now to wield the pen, a voice seems to summon me from my retirement, and to demand of me one final effort before that pen has sunk for ever into disuse and its master into oblivion. It has been my object, during a longer period than most writers can boast of enjoying the public ear, to expose error, to promote truth, and to drive from natural science fiction and theory. How great has been my joy to observe the decline and the dying struggles of the Quinary system, and at length to have witnessed its existence becoming a matter of history, and being merely remembered as a joke against those who had the shallowness and credulity to listen to it; but how great has been my sorrow to see another apparition, more potent than the first, arise Phœnix-like from its ashes, and blaze with a brightness that almost made truth itself look dim.

That such should be the case in this country, I am not at

[c] "With pliant feet" in the Greek, which would make too many feet of it.

all surprised, when I reflect (and how melancholy is that reflection!) that whilst on the continent naturalists are engaged in a constant search after, and a careful examination of, facts, whilst they are diligently adding to our knowledge of animals, both as relates to their structure and economy, nothing attracts attention in this country but theory; and wild indeed must be that theory which does not obtain numerous followers amongst our would-be philosophers.

I doubt not but that this will be disagreeable to most of your contributors, for I find amongst all of them, from the leading ones who write purely original papers, to the minor fry who only venture to criticise or to abridge, the same cant about natural genera, although the artificial nature of such combinations has been fully pointed out by Dr. Fleming, in his admirable Philosophy of Zoology, Vol. II. p. 140, where he proves that natural genera, as they are called, are in reality artificial combinations, which is proved by the genus *Lepus* being reckoned a most natural genus, whilst the two last known species, the hare and the rabbit, are, as he clearly points out, more nearly allied, the former to the horse, the latter to the fox, than they are to one another.

The mention of Dr. Fleming's name naturally calls to our mind the Dichotomous system, the only one that can be considered to be at all conclusive and of any service to the lover of nature. The ridicule that has been attempted to be thrown on this system, and the approving nod that Mr. Newman has given to that attack, induce me here just to shew that the Dichotomous system is founded on nature, and that it is free from all the inconvenience and confusion which even the staunchest advocates of the Quinarian, Trinarian, or Septenary systems allow to exist in their favourites.

If we take a considerable number of species and carefully examine them, we shall find that one portion of them has some character in common which is wanting in the rest; thus affording us a positive and a negative character. Thus in insects we have the *Mandibulata* and *Haustellata*, in *Crustacea*, the *Gymnobranches* and *Cryptobranches* of Lamarck (an author to whom I refer with regret, from the infidel tendency of his doctrines). A similar dichotomy is admitted by Lamarck in the *Arachnida*, namely, into *Arachnides palpistes*, *tubifères*, and *Arachnides palpistes* and *tenailles*, to say

nothing of his first division of his *Arachnides* into *antennistes* and *palpistes*. These divisions appear to me to be all of equal value, at least to those of *Haustellata* and *Mandibulata*, which MacLeay puts as two separate circles, whilst he places the *Crustacea* all in one. Proceeding lower down in the scale of divisions, we find excellent dichotomies in *Coleoptera* and *Dermaptera*, *Hemiptera* and *Homoptera*, *Trichoptera* and *Neuroptera;* but Mr. Newman, very conveniently for his theory, says that these six orders are but three. To descend still lower, let us take MacLeay's group *Adephaga*, and we find it will divide as follows:—

Hydradephaga	Legs inserted in large pectoral plates.
Gyrinidæ	Fore legs long, antennæ short.
Dytiscidæ	Fore legs not long, antennæ not short.
Geodephaga.	
———	Fore legs not notched.
Cicindeladæ . . .	Jaws, with the claw jointed.
Carabidæ	Jaws, with the claw not jointed.
———	Fore legs notched.
Scaritesidæ . . .	Abdomen pedunculate.
——— . . .	Abdomen not pedunculate.
Brachinidæ . .	Elytra truncate.
Harpalidæ . .	Elytra not truncate.
These last divided into	
Harpalini . .	Palpi not pointed.
Bembidiina .	Palpi pointed.

If here is not enough to prove to any one the conclusive nature of the Dichotomous system, his intellects must be most obtuse or most strangely bewildered by some favourite theory. Let any one who with an unprejudiced mind has compared the long tedious characters of genera or families, given by the modern schools, with the clear, simple, and intelligible definitions resulting from the dichotomous method,—let such a person say how infinitely superior the latter method is. I defy Mr. Newman to point out any arrangement of the group which I have explained above, which equals, for clearness, truth, and utility, the one which I have given. As to circular systems, have we not already had three different numbers proposed by different writers, each of whom maintains the cause of his favourite number as the only true one? First stepped forward Mr. MacLeay (and I much regret that the first of these

wild theorists should be a Scotchman), maintaining that all groups in nature were resolvable into five smaller ones, or that if there appeared to be more or less than that number it arose from our ignorance of the true nature of that group.

Mr. Vigors next took it up, and attempted to apply quinarianism to birds; but here he utterly failed, though I cannot join with Mr. Newman in considering that failure as a proof of the truth of *his* system, but, on the contrary, am induced to look upon Dr. Fleming's arrangement as the only perfect one. Soon after Mr. Newman proclaimed his number seven to be the only natural and scriptural one; but more of him hereafter. I must first say a few words to the champion of number three, Mr. Swainson, undoubtedly an excellent naturalist, but grievously led away by theory.

I wish to ask him in what way he would divide *Mammalia*, reptiles, fishes, or the annulose animals, each into three equal groups; how, in particular, he would divide insects; what his three main divisions in that group would consist of; and then the divisions into which each of these are resolvable.

Now, to return to Mr. Newman's book; notwithstanding the extensive circulation and great consideration into which it has risen, owing to the morbid propensity of our present race of naturalists to run after wild and vague theories and to desert truth, I firmly believe that it would have been better for the cause of true science that it should have been burnt by the hands of the common hangman.

After asserting that MacLeay is right as to the circular arrangement of groups, the author says that he is still in want of some number to allot them by, and then jumps at the conclusion that seven is the right and scriptural one; a main reason for thinking so, being, that Cuvier formerly divided animals into seven groups, but had subsequently renounced that number for four. Another reason is that he can find amongst *Mammalia*, *Aves*, or *Insects*, no possible way of making eight equal groups out of them; but here let me ask, are there no such orders, or, as he very properly wishes them to be called, classes, as *Dermaptera*, *Strepsiptera*, *Hymenoptera?* Again, are there but six groups of equal rank to *Vertebrata*, whilst he allows forty-nine of equal rank to *Mammalia?* Let the author answer these questions if he can.

The remarks Mr. Newman makes about the distinction

between *Haustellata* and *Mandibulata*, instead of proving the incorrectness of that division, merely serve to shew the author allows himself to be led away by an *ignis fatuus* of his brain, which blinds his perception of the true method of scientific arrangement so apparent in this dichotomy.

To make out his favourite number seven, this author (whose youth may, perhaps, be pleaded a little in excuse for his zeal for innovation) forces at one time two groups into one, at another he divides groups which even the leader of this school of innovations left untouched; witness, for an example of the first, his putting the *Homoptera* and *Hemiptera* into one group, and especially his reuniting the *Trichoptera* to the *Neuroptera*, the distinctions between which your correspondent, Clericus, has so well pointed out; for an example of the second, we need only refer to his separating the *Egeriadæ*, *Zygænadæ*, and *Glaucopisidæ* from the *Lepidoptera Crepuscularia;* thereby making the *Sphinxidæ*[a] a group of equal importance with the whole genus *Papilio* of Linnæus.

The erroneous nature of Mr. Newman's theory shews itself most plainly in these smaller groups; for instance, instead of two groups, as there are in fact in the *G. Papilio* of Linnæus, namely, *Papilionidæ* and *Hesperiadæ*, he must, in some way which he does not point out, make seven families; in the *Lep. Crepuscularia* ten, for out of the *Sphinxidæ* he will have to make seven; and though he has in the *Bombyxidæ* made out his full number, it is only by putting in two groups of insects, belonging one to the *Lep. Crepuscularia*, the other to the *Noctuadæ*. Thus are those who neglect the clear light of the Dichotomous system leading us into a labyrinth from which, if we proceed further, we shall be unable to extricate ourselves.

Although I have much to say on this subject, I shall not trouble you any further at present with observations on a system which I hope to see soon fall into oblivion; because, from the tone of all your correspondents, with one or two exceptions, I well know that such truths as mine will not be at all agreeable. I cannot, however, conclude without observing, that I consider this essay to be the production of a young man whose abilities, when ripened by age and experience, will shed

[a] I doubt not but that some of your readers may sneer at the terminations of the names of these groups; but, when I have Dr. Fleming for my guide, I fear not that I shall be found erring.

lustre on his country, and that the fame it has earned the author is, in a great degree, merited by the lucid and forcible manner in which he has exposed some of the absurdities of system-makers; but, alas! such fame is little worth, when it only lends to blind us to our own imperfections.

Yours, D. D.

Art. LIII.—*Notes on the Habits of Insects.*—By Delta.

Before leaving my garden, I will just point out to such of your readers as are fond of having long rows of species in their drawers, a method by which they may succeed in capturing many species not always to be found in cabinets; but unless they live in the country, have a garden and a hot-bed therein, all I am about to say will be but of little use to them. Nevertheless, for the benefit of those who may be in a similar situation to myself, allow me to say, that if they lay a flat piece of old board on the dung in front of the frame, first sprinkling a little water on the bed, if very dry, they will, on turning it over a few days after, when the sun is full on it, find many insects adhering to the under-side, amongst them some rather rare.

Besides *Scydmænus tarsatus*, *S. hirticollis*, *S. collaris*, *S. pusillus*, *Euplectus Karstenii*, and *Reichenbachii*, which come to prey on the minute *Thysanoura*, which mostly swarm in such a situation, I have met with the following insects:

Sphæridium Daltoni,
Agathidium ferrugineum,
Clambus Armadillus,
Orthoperus punctum,
Trichopteryx atomaria,
minima,
Trich. minuta, and 2 apparently new sp.
Latridius carinatus,
elongatus,
Cryptophagus, several sp.
Mycetæa fumata,
Rhyzophagus rufus,
Monotoma picipes,
pallida,
angustata,
Abræus minutus;

and innumerable *Cercya* and *Brachelytra*, whose names I could not enumerate.

Mycetæa fumata, Mr. Stephens says, is very rare. I should rather say, that it is one of the commonest of insects, having been found in profusion in old posts, out-buildings, and in cellars, where it often attacks the corks of bottles.

The *Scydmæni* are very carnivorous; they take a small

Podura, or one of the *Acari*, in their jaws, and walk about slowly, whilst devouring it: this, no doubt, is a harmony of nature, St. Pierre having long ago said, that what he meant by the harmony of nature was well illustrated by a wolf eating a lamb.

A better exemplification of this aristocratical kind of harmony is afforded us by the genus *Dioctria*, which preys on those ruthless destroyers, the *Ichneumonidæ;* at least, I have never found the common dark-winged species, *D. ælandica*, feeding on any but an *Ichneumonidæ*, (that, I am told, is the newest London phraseology) an *Apidæ*, a *Carabidæ*, &c., though I have seen dozens feeding on insects of this family.

About eighteen miles from us is the pleasant little village of Walton, which is fast becoming a fashionable place of resort for us North-Essexians;—a sweet spot it is, too, for any one who loves Nature,—for one who is willing to contemplate, in its cliffs, the remains of a former race of animals; for, when a high tide washes away parts of them, it often lays bare large bones, immense multitudes of fossil shells, &c. The botanist, too, may find many a rare plant on the shore, and in the marshes; amongst which I will only mention one, *Peucadanum officinale*, discovered here by my friend, J. Grubb. The ornithologist may find pleasure in listening to the plaintive note of the ring-plover, the harsh scream of the tern, or the hoarse croak of the cormorant;—he may watch the dunlins, the purple sandpipers, the sanderlings, coursing along the sands, or skimming lightly over the water; and if he does not, whilst walking along the shore on a calm summer's morn, when the sun is just rising above the sea, and when no sound is heard save the gentle murmuring of the waves and the notes of the sea-birds,—if in such an hour he does not feel the calmness of the scene—

> "Steal to his heart, and make all summer there,"—

he is altogether unworthy to be called by the name of man.

But all this is quite away from my subject; but, I am given to wandering; and, Mr. Editor, if you do not check me, by leaving out, now and then, such parts of my letters as are not entomological, you will have me writing to you, not letters on the habits of insects, but letters *de omnibus rebus et quibusdam aliis.*

To return to entomology:—In the marshes a small black *Leiodes* is found on the ears of *Triticum repens*, wherever it is attacked by a disease similar to what in wheat is termed the smut. I have never had an opportunity of making out its habits and history fully, therefore I can only conjecture, that, like its near neighbour in systematic catalogues, *Phalacrus*, it feeds on the small fungilli which cause that disease. Under the weeds by the sides of the ditches, especially under the spreading branches of *Atriplex partulaccoides*, innumerable *Coleoptera* shelter themselves; amongst which are *Ophonus pubescens* and *Pogonus chalceus* in profusion; *Ophonus obscurus*, &c.; *Amara atra*, *eurynota*, &c.; *Harpalus subcæruleus*, *dentatus*, *confinis*, &c.; *Curtonotus convexiusculus*, *Broscus cephalotes*, *Lopha nigra*, &c.; *Simplocaria semi-striata*, *Scymnus*, several species, amongst which I have two apparently nondescripts.

On the flowers, by the sides of the sea-walls, may be found *Pachyta livida;* and an *Eristalis*, of which I know not the trivial name, and which I do not remember to have seen in any London cabinet I have visited.

Setina irrorella is very common at a place called Stone Point, about four miles from the village. I have also found it at Mercey Island, and believe it to be common along all this part of the coast; but Stone Point is its head quarters. I have taken thirty or forty specimens, as fast as I could pin them; and my friend, J. Grubb, informs me, that about five years back he saw, literally, hundreds lying dead on the ground, or impaled on the blades of grass, and *Psamma maritima;* how they came into the latter situation, I cannot imagine; but there they were, by the dozen. They fly very early, from three to six in the morning, but may be found sitting on the blades of grass. The males appear a few days earlier than the females.

Lasiocampa castrensis, and *Agrotis cespitis*, have also been found here; the former, in the larva state, on *Artemisia maritima*.

I was much surprised to find, in Stephens's valuable work, so erroneous a description of the larva of *Nonagria Typhæ*, as the following: "Caterpillar green, spotted with black, with a palish lateral line." I had seen, perhaps, a hundred larvæ, and never one with the least shade of green. To be

certain of the fact, I went this year to a pond, where *Typha latifolia* abounds; it was the first week in June;—a few of the bulrushes had the inner leaves yellowish and faded. On opening these, I found the larvæ of a whitish colour, like those of *Agrotis;* they are long, slender, with a corneous brown plate on the *prothorax,*[a] and a paler dorsal and lateral line, of a somewhat transparent appearance. By the middle of July they had become thicker, and more of a brown hue. They evidently do not subsist each on one plant, but having devoured the pith of the flower-stalk, and the base of the youngest leaves, they quit that plant for another, eating, I believe, downwards. When full grown, they spin a web in the upper part of the stem, intermingling with the silk a large proportion of the fibres of the bulrush, which they have gnawed off, always undergoing their metamorphosis head downward. They remain about three or four weeks in the pupa; the imago may sometimes be found amongst the plants on which the larvæ have fed.

Sparganium erectum is attacked by a smaller moth,[b] of which I send you specimens in all the stages of larva, pupa, and imago. The larva above is of a lightish brown, with a paler dorsal line, beneath whitish; on the *prothorax* is a broad corneous plate; the *telum* is singularly flattened, with two or three stiffish hairs at the extremity. There are also a few scattered hairs on some of the other segments. The pupa is pale-brown, elongate, with a furcate horn above the eyes, and a small protuberance behind them. Around the middle of each of the lower segments, commencing with the *octoon,* is a row of small spines pointing downwards,—something resembling that in the xylophagous Lepidoptera. The whole appearance of the pupa reminds us of those of some *Tipulæ.*

In habit, this moth resembles *Non. Typhæ;* but the larva appears not to visit more than one plant. The pupa has the head upwards.

I am yours, most truly,

Δ.

[a] For the meaning of these terms, your reader will be kind enough to refer to Mr. Newman's highly useful paper on Osteology, at p. 394; before the publication of which it was next to an impossibility to give an intelligible description of a larva.—Δ.

[b] *Orthotænia nervosa.*—Ed.

Art. LIV.—*The Learned Fleas.*

Juvat imbribus actis
Progeniem parvam revisere— VIRGIL.

Compelled to shelter from a shower,
We whiled away a pleasant hour,
Revisiting the learned fleas. H. D.

Courteous Reader,—It is a pleasant thing to see human intellect soaring triumphantly over every obstacle and commanding applause. It is a pleasant thing to hear a philosopher lecturing of the motions of worlds, or the combinations of atoms, on the taming of elephants, or the breaking-in of fleas. Large and small are terms without a meaning. Size has no existence. Comparison is the only measure. Is our philosophy intelligible? are we understood? Yes; we know we are understood.

Fleas have lately obtained an unusual share of notice. M. Dugés supplied them with wings and antennæ; Mr. Newman denies their claim to eyes; and Messrs. Curtis and Westwood give them hard names: but greater honours than these were in store for them; and our friend in Regent-street,[a]—worthy man,—has taught them habits of civilized life, and shown them to be exceedingly docile, if not rational, creatures; we find, however, that their merits are still but little known to the world, and we hasten to record them.

In the exhibition-room is a large elevated table, covered with green cloth; on this are several small tables, say six or eight inches square, and these are covered with white paper, and are the stages on which the Messrs. Flea perform; and now, courteous reader, we will conclude this introduction of our subject, by introducing thee to the great master of the fleas, and allow him to explain the exhibition in his own way.

"This, you see, ladies, is a mail-coach; it is made just like a mail coach in every part; take this glass and examine it; you will observe the wheels are perfect, and every part; there are four passengers inside; the horses are fleas, all harnessed with silk harness, and all buckled on its proper place; the coachman is a flea, with a whip, and the guard is also a flea, with a silver tin-horn, which he puts to his mouth every now

[a] No. 238, opposite Hanover-street.

and then and blows.—Use this glass, Sir.—Go on [to the fleas]—the coachman cracks his whip, and the guard blows his horn. You may see him put it to his mouth, but the sound is so small that you cannot hear it,—there, you see, he drives as straight as a mail-coachman.

" This is a gig, with a lady and gentleman, drawn by a single flea,—go on. This is a figure of a elephant, with a castle on its back, and a good many men in it, drawn by a single flea; this is a very great weight for one flea—go on; —it shews what great strength it possess. There is Wellington,—go on, you are sulky,—Blucher, and Napoleon, the three heroes of Waterloo, mounted on fleas; the figures are of paper, and are all very like; the Duke of Wellington is perfect likeness.

" There are two fleas settling a dispute of honour after the ancient method; each flea is covered with armour and provided with a lance—go on;—there, you see them spear one another—they do not hurt each other much. There is a flea with a blue petticoat on, he is drawing up a bucket of water out of a well; the chain and the bucket is gold; if you watch, you will see the bucket come up out of the well. This is a treadmill, in which the fleas are broke in, and cured of leaping; when the flea leaps, he knocks his head against the top, and he does not like that; there is one in now, when he moves—there! you see it go round.

" This is a ball-room: it is the top of a musical snuff-box; this raised part is the orchestra; there are twenty-one fleas, musicians—seven violins, one violoncello, three French-horns, two bassoons, two key-bugles, four clarionets, one octave, and one harp—all the instruments of music are of gold; round the room are a great number of fleas, ladies and gentlemen, on chairs; there are two fleas, lady and a gentleman, flirting; and there is an old lady in spectacles reading the Times newspaper; in the middle are some ladies and gentlemen waiting for the music, to begin waltzing; directly the music begins, the musicians will all play their music, and the dancers begin dancing; there, now I will touch the key; there, you see,—take the glass, Miss, and look at the violin-players." " Oh, do look, ma! they're all fiddling" "Yes, and the waltzers are twirling round and round. I have heard many young ladies say they wish they could waltz so well. Take the glass,

Mr. D. Now the tune is almost done, and they will all stop; they do not move one moment longer than the music lasts:—there, they are all stopped. In the other part of the room is something more to be seen."

We accordingly went to the other end of the room, where were several perfect fleas, their larvæ, eggs, &c., under very tolerable glasses; the larvæ are long, apod, white worms, and struck us as being very like those so common in decaying cheese; some years back we should have added—*Musca putris;* but, alas! the insect has had so many names that we have no idea now which is the right one, we will therefore call it the cheese-fly. The figures of the larva of the flea, in Rœsel, are very accurate.

The fleas, in this exhibition, certainly are made to perform a great proportion of the feats which their proprietor describes, but we must not send our readers to Regent-street with the impression that these operations are the result of docility and education entirely. In those fleas which draw the mail-coach, gig, &c., we observed, that the cause of their exertion was, an attempt to retreat from the light, and that they invariably travelled towards the dark side of the room, and were as invariably taken back to the light and performed the same journey over again: several of the other operations, we conceive, would be much more easily traced to the restless activity, than the sagacity, of the fleas; but, even after making due allowance for this, there will be found sufficient of the amusing in the exhibition to repay the visitor for the admittance-fee, particularly if, like ourself, he be overtaken by a hasty shower and have half an hour to spare. H. D.

ART. LV.—*Transactions of the Linnæan Society, Vol. XVI. Part III.*

PAGE 471. *Notice of several recent Discoveries in the Structure and Economy of Spiders. By John Blackwall, Esq., F.L.S.*—This is a paper of much interest. The author, in the first place, details the mode in which *Clubiona atrox* constructs its web. The fabrication of a *flocculus*, or compound thread, is highly curious: on the abdominal side of the

first tarsal joint of the hind leg are two parallel rows of spines, moveable at the pleasure of the animal: the spines in the upper row are considerably curved, and taper to a point; those of the lower row are stronger, more closely set, and less curved; the spider presses its spinners against one of the glossy lines, which are the main-stays of its snare, and, emitting from them a small quantity of liquid gum, attaches to it several fine threads; the foot of one of the hind-legs is then applied to the upper part of the first tarsal joint of the other hind-leg, and the apparatus of spines is thus brought immediately beneath the spinners, at a right angle with the line of the abdomen; the apparatus of spines, by a slight motion of the leg, is forced backwards across the *mammulæ*, the diverging extremities of which it touches in its transit; the operation is rapidly repeated, and the lines of the *flocculus* are produced, the spider making room for them by raising and advancing its abdomen. Mr. Blackwall remarks that *Mygale avicularia*, *Drassus melanogaster*, and *Salticus scenicus*, have only two claws on each foot, and *Epeira apoclisa* eight. Naturalists have generally supposed spiders invariably to have but three. He further observes, that the nets of geometricians are composed of *three* different kinds of silk; and that although nets lose their viscidity when exposed to the influence of sun and weather, yet, when artificially protected from the effects of these, they retain it almost unimpaired for many months. With regard to the *ecdysis* of spiders, Mr. Blackwall observes, that the thorax opens laterally, disuniting immediately above the insertion of the mandibles and legs, not from the centre, as Dr. Leach implies; this line of separation extends to the abdomen, which is next disengaged, the extrication of the legs being the last and most difficult operation, though facilitated, as Mr. Blackwall supposes, by the spines with which they are furnished: when the spider is quite free from the slough, it remains for a short period in a state of great exhaustion, suspended by a thread from the spinners, connected with the interior part of the cast skin; after being perfectly quiescent for some time, in order that the new skin may dry and consolidate in some degree, as well as, probably, for the sake of repose, it attaches itself to the suspensory line by its feet, and, climbing up, it returns to its retreat.

Page 487.—*Remarks on the Pulvilli of Insects, by John*

Blackwall, Esq., F. L. S.—The question of the structure of the pulvilli of flies, though often agitated, can hardly yet be considered satisfactorily settled. Mr. Blackwall, after enumerating various opinions published regarding it, has indeed clearly disproved the of late generally received one of Dr. Derham and Sir E. Home, that those parts act as suckers by atmospheric pressure;—for, on enclosing a house-fly in the exhausted receiver of an air-pump, he found, that so long as its vital powers were unimpaired, it was still able to traverse, not only the sides, but the dome of that vessel. In the sentiment, however, which he has himself adopted, or it may be in his explanation of it, he does not appear equally happy. Like Dr. Hooke, he sees the under surface of the *pulvilli* to be covered with closely-set minute hairs, directed downwards; and he considers that insects are enabled to take hold of the roughnesses, or irregularities of the surface of glass, by means of these hairs, their difficulty in doing so increasing with the goodness of the polish; but he remarks, that Hooke was in error in supposing the hairs to be pointed, for to him their extremities seem somewhat enlarged; and if we understand correctly Mr. Blackwall's reference to the preceding paper by himself, he takes this dilated appearance of the ends to be owing to each hair's being fringed by still finer hairs, which form at its extremity a brush on its under surface. The mode of adhesion he accounts to be strictly mechanical, not by the aid of a glutinous secretion, and to depend in great measure on the numerous points of contact presented;—their "influence being from the tarsi outwards." But the manner in which these points can operate in counteracting the force of gravity is left unexplained; and indeed we do not distinctly comprehend the idea here intended to be conveyed. Perhaps some light may be thrown on this obscure subject by introducing a notice of a few observations mostly made in 1825, and recently repeated.

The appearance, under moderate magnifying power, of the *pulvilli* of flies, is well known; their shape, and other particulars, differing according to the species, but maintaining a general resemblance throughout the family. Through a good achromatic microscope, each of the two similar parts, of which they consist, is seen to spread out into a thin flat membrane, more or less transparent, mostly furrowed on the upper

surface in delicate ridges, from the base to the margin, where they terminate in hairs; and these ridges are sometimes crossed by others. In some species, the marginal hairs might well be mistaken, with the less accurate instrument employed by Sir E. Home, for a serrature;—they in reality form the edge of that remarkable covering of the under surface which has so much puzzled observers.

This covering is composed of pellucid elastic hairs, arranged with beautiful regularity, which appear to have their insertion along the ridges just mentioned; all are inflected downwards, and slope a little outwards; and those near the sides of the *pulvillus* are inclined also towards the margin, or project beyond it;—each is nearly of an even thickness till near its extremity, where it is bent suddenly into a knobbed or flattened end. Hooke's comparison of them to the wire-teeth of a card for working wool, was not an inapt one, except that all their terminations, which he calls "tenters," are turned outwards from the *tarsus*.

The under side of the *pulvilli*, seen in a favourable light, when these terminations show as a multitude of bright spots, disposed at equal distances on a flat surface, is among the most striking of microscopic objects. The length and distance of the hairs is not always in proportion to the size of the fly:—in the broad *pulvillus*, for example, of *Sarcophagus carnarius*, they are as close as in that of the house-fly, (*Musca domestica*,) but their number is vastly greater in the larger species. In *Scatophaga stercoraria*, the flat, transparent, and apparently glandular ends, are very distinct.

To obtain a just idea of this apparatus, it should be viewed in different positions, and by reflected, as well as by transmitted light;—the creature should be living, and the linear power employed from two hundred to five hundred.

Flies use their *pulvilli*, or their claws, according to the nature of the surface; and often, when walking horizontally, and on a soft substance, do not touch with either, but rest entirely on other articulations of the *tarsus*. When they adhere to polished glass, in a vertical position, they may be seen, from the other side, to apply to it the bent extremities of the hairs described. Those of nearly the whole *pulvilli* will be employed when the insect is full of vigour, but sometimes, when exhausted, it will be suspended by those of a

small portion only. The parts which touch commonly slide very gradually over the surface, in the direction in which the fly clings by them; and when the foot is detached, a distinct fluid trace will often be left by each individual hair. The spotted pattern, thus left on the glass, seems of an oily character; for, if breathed on, it remains after the condensed moisture is evaporated.

A slight dewiness from the breath, or an oily film on the glass, disables the fly from climbing it, if vertical, but not from traversing it when flat; and the insect ascends dry glass with ease immediately after having done so; but on watching one which seemed stationary on an upright piece, having just walked over a greased surface, it could be seen to be very slowly gliding down without any change in the relative position of its limbs. We have not found that the cleanness, or high polish of glass, causes any difficulty to flies in climbing.

The circumstances related imply, that it is not by the application of extremely small points to invisible irregularities on the surface of glass, that the pulvilli are attached, but by simple adhesion of the enlarged ends of the hairs, assisted by a fluid that is probably secreted there; and we are therefore induced to refer the effect to molecular attraction only—a power difficult to estimate, but evidently great in some cases, when an extremely thin flat surface is placed in contact with a smooth body;—and, in the present instance, the manner in which the bent expanded ends of the congeries of elastic hairs are applied, is particularly favourable for its exertion.

When a fly would increase the firmness of its hold, it contracts its leg so as to draw the *tarsi* to a direction more nearly parallel to the glass, thus bringing into contact the hairs of the whole *pulvillus*, and a larger portion of each hair. On the other hand, the foot is detached by an outward and upward impulse given to the *tarsus;* the tendency of which must be to draw off the ends of the hairs in rapid succession, beginning with those next it. This act is, as we suspect, assisted by a strong blunt bristle that projects from a tuft of hair between the *pulvilli*, and has a motion independent of them; and by the two claws that spring from one base, and branch over on each side, their ends touching the glass, and preserving the position of the foot as the insect clings. We have seen a blue-bottle fly, (*Musca vomitoria*,) when so confined as not to be able to apply

his effort in the right direction, wriggle his leg about for some seconds before he could release an adhering portion of the *pulvillus*.

If we might suppose the supply of fluid at the end of each hair to vary according to occasion, it would furnish an additional explanation of the adhesion and disengagement of these extraordinary organs, as well as of their remarkable freedom from dust and impurities while the insect is healthy; but we must not proceed further with conjecture.

Page 607. *On the Paussidæ, a family of Coleopterous Insects. By Mr. J. O. Westwood, F. L. S.*—This is a most diffuse paper; it is extended over seventy quarto pages: had the essence of it been compressed into two or three pages of this Magazine, it would have been useful as describing a few new species, and in its place as being likely to be read by technical entomologists. Mr. Westwood writes at great length on the views of other authors, as to the affinities of *Paussus*, none of which he seems to approve, but forgets the necessity of adding something better or more definite of his own; indeed, he appears to have been misled by Donovan into the notion of connecting *Paussus* and *Cerapterus;* and his family, *Paussidæ*, in consequence, much resembles a "Refuge for the Destitute," in which all manner of outlaws are collected together; the characters, "*antennæ articulis*, 2—10," and "*Labrum magnum*" for the family, with "*Labrum minutum*" for one of its genera, will give the reader some idea of the limits to which Mr. Westwood's family, *Paussidæ*, is restricted. We must say another word on this paper, a word applicable alike to all the writings by the same author, viz., that we disapprove of the language of dictation which Mr. Westwood employs: he never addresses his reader but as his "student," and is continually referring his "student" to what he has said in other places: now, the paper in question will stand no chance of being read by any individual who is not a tolerable entomologist; and no man likes to be called a student: it is not at all inviting to the readers of scientific works. Modesty is a jewel of inestimable value, and one which almost invariably accompanies real merit. Let us refer to the writings of Newton; or, more recently, and more in our own way, to those of the late illustrious Latreille. What depth of research! what capacity, what strength of mind!

adorned with the purest, the sincerest, modesty. We have still amongst us examples equally brilliant; philosophers whose grey heads are as much loved for their meekness as respected for their knowledge. Is there not such an one in entomology? is there not one placed on an eminence so far above us that he might dictate to us all? but we see him willing to learn of all, to bear with all, to yield to all; the mildest, most humble, most unassuming of men, clothed as it were in a complete unconsciousness of his own superiority. The fact is, that a sip of the waters of science intoxicates—a deep draught sobers. The smatterer in learning wonders that he knows so much; the devoted student that he knows so little. It is only when we have made some progress in the paths of knowledge that we can form any just idea of their extent. Man is somewhat like a drum,—the sound is a symptom of its emptiness. When a man recounts his own deeds, it is a sign that no one else thinks them worth recounting: such a man's fame depends upon the length of his life; for after his tongue has ceased to move, and his hand to hold the pen, no one will take enough interest in the theme to renew it. These little observations may be trite, but they are nevertheless wholesome, and we hope their introduction here will not be taken amiss. Their application may be made by each of us without risk of injury; for who is there that can boast of sufficient knowledge to authorize his disregard of modesty.

Art. LVI.—*British Entomology. Nos.* 111—116. By John Curtis, F.L.S.

We never recollect addressing ourselves to a task which we so heartily wished to avoid, as that on which we are now about to enter; nothing but the call of imperative duty could induce us to undertake it. We have been angry, but we shall not commit ourselves; the first burst of indignation has passed away, and in sorrow, in deep sorrow, do we ascend the tribunal which we are compelled to occupy, and judge between the offender and the offended.

Most of our readers are already aware of the painful subject to which we allude; it is one of those unwarrantable attacks of one author on another which, for years past, have occasionally disgraced the paths of science, and, in this instance, it appears under the peculiarly aggravated circumstances of being unfounded in truth, and perpetrated at a time when misfortune had entitled the subject of the attack to universal sympathy.

Mr. Curtis has thought proper to publish, as an appendage to a description of *Cercopis*, merely, as he says, because "there is space for an observation or two," a charge against Mr. Stephens, that, in the second edition of the Nomenclature, he has "copied column after column from the Guide," "adopted the plan of the Guide," and made the Nomenclature "rather a second edition of the Guide than of the Nomenclature:" than the first and last of these charges, we never met with more gratuitous or untenable assertions: we pronounce this after having compared the two works word for word. With regard to the plan, *i. e.* in the addition of consecutive numbers to the genera and species, and the adoption of the mode of printing, Mr. Stephens has, we are aware, imitated; he could not have done otherwise; but in what manner this is an injury to Mr. Curtis, we defy human ingenuity to point out. Is it not the every-day custom to adopt any new mode or fashion in the getting up of a book? The only portions of the two works which bear any similarity are those in which the *Ichneumonidæ* occur, and the cause of the similarity here is, not that either has copied from the other, but that both have copied from another work, "Gravenhorst's Ichneumonologia," and this surely can be no just cause of complaint; the right of copying a foreign work cannot be confined to a single individual.

The cruel allusion to the affair with Rennie,—an affair which we consider reflects any thing but credit on the laws of this country, is the most unfeeling of all, and betrays a spirit of deep-rooted animosity and revenge which lowers our opinion of our kind. We presumed that the circumstances under which Mr. Stephens was placed had rendered him an object of kindly feeling with all scientific men; we imagined that self-respect would have prevented a Briton from striking another in distress; we supposed British honour would have

revolted from such a deed; we have, in fact, been deceiving ourselves,—we have been leaning on a reed.

How strenuously, how enthusiastically, have we laboured to eradicate the base and injurious party-spirit which has so long pervaded the paths of science;—and is this the fruit? is this the brotherly spirit we invoked? is this the endeavour, of which we urged the necessity, to forgive the past and to avoid offence for the future?

We see no termination to the mischief now a-foot: we see that a fresh question may now, in self-defence, be agitated: we see that Mr. Curtis's title to the copyright of this List may be examined; this attack is a fair challenge to the inquiry. We fear that Mr. Curtis will find that he had better, far better, have committed the whole copy of that tainted number to the flames, than have ventured to risk it on the excited wave of public opinion.

It is with pleasure we return from these observations to the beautiful work before us; for it is so much more gratifying to applaud than to condemn, that we would fain always applaud. In the present numbers, however, as a general observation, we would say, that Mr. Curtis is too much inclined to yield to the mania of the day for making genera and species, which the wheel of science, in its rotation, must inevitably fling from its circumference. Name-giving is one of the least important parts of a work like this; it were better to illustrate genera and species already described, than venture on the intricate task of making new ones.

The contents of the April number are, 1. *Hesperia Actæon*, a new butterfly, for which we are indebted to that indefatigable entomologist, Mr. Dale, whose important discoveries have enriched almost every column of our list. Mr. Curtis's character of the larva and pupa of the *Hesperidæ* is scarcely sufficient; we will improve it. "Larva elongate," attenuated gradually towards either end; "head large," porrected; "six pectoral, eight abdominal, and two anal, feet;"[a] "pupa" smooth, unangulated, head-case rounded, tail pointed, "enclosed in a" slight loose "web," through which it is visible, "or in leaves held together by threads," girted and attached by the tail. 2. *Callicerus Spencii*, one of the *Brachelytra*.

[a] The number and situation of feet is invariable in *Papilionidæ*.

3. *Molophilus brevipennis*, in its hairy body and wings, and in its *tarsi*, which are naturally more curved than represented in the plate, resembles some species of *Cecidomyia*; the *prothorax* in the figure is rather too elongate. We wonder Mr. Curtis does not allude to Dalman's genus, *Chionea*, which beautifully connects *Molophilus* with the *Cecidomyiæ*. 4. *Asiraca pulchella* is *Cicada crassicornis* of Creutzer. 5. *Carabus exasperatus* is *C. violaceus*, and totally distinct from *C. exasperatus*, Duft., as may be seen by a glance at Dejean's figure. 6. *Ephyra pictaria*, one of the *Geometridæ*. 7. *Lasioglossum tricingulum* is *Halictus Xanthopus*. 8. *Issus Coleoptratus*, a beautiful variety; an Hemipterous insect.

The contents of the June number are:—1. *Aspidiphorus orbiculatus*, a minute Coleopterous insect. 2. *Cerapteryx hibernicus* is *Chareas graminis*. 3. *Volucella inflata*, a Dipterous insect. Mr. Curtis has omitted to mention the singular fact, that *V. bombylans* and *V. inflata*, although so different in appearance, are but a single species. 4. *Coranus subapterus*, a new genus of Hemiptera, allied to *Reduvius*. 5. *Drypta emarginata*, one of the genera connecting the Linnæan groups, *Cicindela* and *Carabus*. 6. *Aglossa Streatfeildii*, one of the *Pyralidæ*. 7. *Gryllotalpa vulgaris*, the mole-cricket. Of the note of this insect, a word from Dr. K——; not the Dr. Kidd to whom Mr. Curtis refers, but Dr. K—— the field and forest lover — the observer of living nature. Speaking of the fern-owl, he says:—

"I believe its very peculiar note is uttered sitting, and never on the wing. I have seen it on a stack of turf, with its throat nearly touching the turf, and its tail elevated; and have heard it in that situation utter its call, which resembles the birr of the mole-cricket, an insect very abundant in this neighbourhood. I have almost been induced to think this noise serves as a decoy to the male mole-cricket, this being occasionally found in the craw of these birds when shot. Those who may not be acquainted with the cry of the bird or the insect, may imagine the noise of an auger boring oak, or any hard wood, continued, and not broken off, as is the noise of the auger from the constant changing of hands."[b]

8. *Cladius pilicornis*, one of the *Tenthredinidæ*. Is this distinct from *C. difformis?*

[b] Loudon's Mag. of Nat. Hist. Vol. V. p. 603.

The contents of the August number, are:—1. *Harpalus ruficeps*, an immature specimen of *H. Hottentota* of Sturm; to which species the *H. punctiger* of Stephens is also referable. 2. *Nonagria Vectis*, one of the *Noctuidæ*. A correspondent[c] has sent us *Nonagria Typhæ* in all its stages. The larva is a most singular one; it is very elongate and slender, of a dirty brown colour, longitudinally striped up the back and sides with darker lines;—it does not confine itself to an upright position, as Duponchel observes, and Mr. Curtis repeats, but enters the stem of the *Typha*, usually about eight inches above the water, and continues to devour the central portion to the water's-edge; it then comes out, and attacks another and another. 3. *Oryssus coronatus*. The description of this rare insect should have been much more explicit, as its relation to *Sirex*, in a natural arrangement, is a matter of great importance. Mr. Curtis has dismissed the description of those segments which would establish this, in the following words—"Thorax not larger than the head." 5. *Falagria thoracica*, one of the *Brachelytra*. 6. *Adela Frischella*. This is a bad plate; too much gilding and varnishing. 7. *Mesochorus sericans*, one of the *Ichneumonidæ*, and a beautiful figure. 8. *Pyrrhoceris apterus*, one of the *Cimicidæ*. The description of this insect is accompanied by some sensible observations on the probable causes of the occasional swarming of peculiar species of insects.

Art. LVII.—*Monographia Chalcidum.* By Francis Walker, Esq. F.L.S.

(Continued from page 384.)

Genus X. Dicyclus,[a] *Walker.*

Caput thorace latius: antennæ 13-articulatæ, clavatæ; articulus 1us. elongatus; 2us. elongato-cyathiformis; 3us. et 4us. minimi; 5us. et sequentes ad 10um. æquales, breves; clava elongata, articulis 9°. et 10°. æqualis: mandibulæ 4-dentatæ; una arcuata, dentibus acuminatis; altera recta, dentibus ferè obtusis: maxillæ elongatæ, apicem versus internè in lobum productæ: palpi maxillares filiformes; articulus 1us. mediocris; 2us. paullò longior; 3us. brevior;

[c] Δ. [illegible]

[a] δὶς bis, κύκλος circulus.

4us. 2°. et 3°. æqualis, acuminatus: mentum elongato-ovatum: labium anticè latum, rotundatum: palpi labiales articulo 2°. minuto: thorax brevis: prothoracis scutellum parvum: mesothoracis scutum magnum; suturæ laterales vix conspicuæ; epimera et paraptera majuscula; scutellum ovatum, convexum, mediocre: metathoracis scutellum parvum, canaliculatum: petiolus brevis: abdomen elongato-ovatum aut ferè rotundum; segmentum 2um. maximum; sequentia parva: pedes graciles; tibiæ rectæ.

Sp. 1. Dic. æneus. Fem. *Viridi-æneus, antennis nigro-fuscis, pedibus rufis, alis hyalinis.* (Alarum longitudo, 1—1½ lin.)

August; grass in fields; near London. I have sometimes found it wingless.

Sp. 2. Dic. circulus. Fem. *Æneo-viridis, antennis nigro-fuscis, pedibus rufo-fuscis, alis subfuscis.* (Alarum longitudo, 1 lin.)

September; Isle of Wight.

Sp. 3. Dic. fuscicornis. Mas. et Fem. *Viridis* mas *aut æneo-viridis* fem., *antennis fuscis, pedibus rufis,* fem. *femoribus æneis, alis subfuscis* mas *aut fuscis* fem. (Alarum longitudo, ¾—1 lin.)

September; Isle of Wight.

Sp. 4. Dic. tristis. Fem. *Æneo-viridis, obscurus, abdomine nitido, antennis nigris, pedibus rufis, alis subhyalinis.* (Alarum longitudo, 1¼ lin.)

September; Isle of Wight.

Sp. 5. Dic. brevicornis. Fem. *Æneo-viridis, abdomine viridi, antennis nigris, pedibus rufis, alis fuscis.* (Alarum longitudo, 1 lin.)

August; grass in fields; near London.

Genus XI. Pachylarthrus,[b] *Westwood.*

Caput magnum, thorace latius: oculi mediocres: antennæ 13-articulatæ, *maris* filiformes, *fem.* subclavatæ; articulus 1us. elongatus,

[b] Since I published the characters of *Cyrtogaster,* Mr. Westwood has kindly sent to me a description of the male of *Cyrtogaster rufipes,* under the name of *Pachylarthrus tibialis.* Having dissected the mouth of the female only, I was

longitudine ferè triens; 2us. elongato-cyathiformis; 3us. et 4us. minimi; 5us. et sequentes ad 10um. æquales, latiores; clava triarticulata, ovata, articulis 9°. et 10°. æqualis: mandibulæ 4-dentatæ, elongatæ, validæ, arcuatæ; dens basalis obtusa: maxillæ ovatæ, anticè in lobum elongatum productæ externè pilosum: palpi maxillares 4-articulati, graciles; articulus 1us. mediocris; 2us. longior; *maris* 3us. et 4us. dilatati; *fem.* 3us. 2°. brevior; 4us. 2°. æqualis, acuminatus: mentum ovatum: labium anticè dilatatum, rotundatum: palpi labiales filiformes; articulus 1us. elongatus; 2us. minutus; 3us. 1°. æqualis, apice acuminatus: prothorax parvus: mesothoracis scutum mediocre; suturæ non benè determinatæ; paraptera, epimera et scutellum magna: metathoracis scutellum magnum, medio carinatum: petiolus brevissimus: *maris* abdomen parvum, vix convexum, apice latum; segmenta subtus versus abdominis basin retracta; 2um. maximum, abdominis ferè dimidium occupans; sequentia minima: *fem.* abdomen ovatum, subtus carinatum, apice acuminatum; oviductus in carinula ventrali receptus, segmenti 3^i^. apicem versus apparens, non ultra abdomen exertus: pedes graciles; tibiæ rectæ.

Sp. 1. Pach. smaragdinus. Mas. *Cyaneo-viridis, antennis rufis, pedibus flavis, femoribus posticis fusco-maculatis, alis hyalinis.* (Alarum longitudo, 3 lin.)

Phagonia smaragdina.—*Curtis, Brit. Ent.* 427.

Fem. ?—Cyanea, antennis nigris, femoribus cyaneis.

July; on a currant-bush; near London.

Sp. 2. Pach. flavicornis. Mas et Fem. *Lætè viridis, antennis* maris *rufis apice fuscis,* fem. *nigris, pedibus rufis, femoribus* fem. *viridibus, alis fuscis.* (Alarum longitudo, $1\frac{1}{2}$—2 lin.)

not aware that the males of the above-mentioned genus have the tips of their maxillary palpi incrassated. This is Mr. Westwood's description:—

"*Viridis, palpis nigro-viridibus, tibiis tarsisque intermediis nigris.* ♂. (Long. corp. lin. $\frac{2}{3}$; expans. alar. $1\frac{1}{2}$.)

Habitat prope Londinum.—*In Mus. Lewis.*

Caput thorax et abdomen viridia, aureo vix tincta, illa punctatissima, hoc nitidum basi depressum, longius quam in *Pach. patellano:* mandibulæ ochreæ apice fuscæ: palpi maxillares nigri cæruleo-viridi nitentes: antennæ pedesque obscurè fulvescentes, tarsis anticis et posticis apice fuscis, pedum intermediorum tibiis (nisi ad basin) tarsisque fusco-nigris: alæ albæ viridescentes, nervis pallidis."

It is requisite to add to my character of *Cyrtogaster*—*Maris* palpi maxillares apice incrassati.

Phagonia flavicornis. *Haliday.—Curtis, Brit. Ent.* 427.
June; on ferns; near London. Windsor. Hampshire.

Sp. 3. Pach. patellanus. Mas. *Lætè viridis, antennis rufis, pedibus flavis, alis hyalinis.* (Alarum longitudo, $\frac{3}{4}$—$1\frac{1}{2}$ lin.)
Diplolepis patellana . *Dalman. Stock. Trans.* 1822.
Pachylarthrus insignis. *Westwood. Lond. & Edinb. Phil. Mag. & Journ. of Science.* Third Series. No. II. p. 127.
August; grass in fields; near London. September; Isle of Wight.

Genus XII. Miscogaster,[c] *Walker.*

Caput mediocre: *maris* antennæ 14-articulatæ, filiformes, nonnunquam extrorsum crassiores, pubescentes; articulus 1us. elongatus; 2us. brevis, rotundus; 3us. et 4us. brevissimi; 5us. et 6 sequentes elongatæ, remotæ, lineares; clava triarticulata, apice acuminata, articulo 11°. multo longior: *fem.* antennæ 13-articulatæ, subclavatæ aut clavatæ; articulus 2us. brevis, cyathiformis; 5us. et 5 sequentes æquales, lineares; clava articulis 9°. et 10°. paullò brevior: mandibulæ 4-dentatæ, elongatæ, validæ, arcuatæ; dens basalis obtusa: maxillæ ovatæ, anticè in lobum elongatum productæ, externè pilosæ: palpi maxillares 4-articulati, filiformes; articulus 1us. brevis; 2us. longior; 3us. 2°. longior; 4us. 3°. æqualis, internè convexum et setosum: mentum breve, obconicum: labium elongatum, convexum, anticè paullò latius: palpi labiales articulis 3; 1us. apice latior; 2us. brevis; 3us. 1°. longitudine æqualis, angustior, apice setosus: prothorax non benè determinatus, anticè capite obtectus, medio angustior: mesothoracis scutum benè determinatum, suturæ optimè conspicuæ; paraptera trigona, maxima; scutellum benè determinatum, angustum; sternum magnum: metathoracis præscutum et scutum angusta; paraptera trigona, maxima; scutellum optimè determinatum, medio canaliculatum; postscutellum parvum: petiolus brevis, crassus, punctatus: *maris* abdomen thoraci longitudine æqualis, sublineare, depressum, medio vix concavum; segmentum 2um. maximum, abdominis triens; 3um. 4um. et 5um. parva; 6um. longius; 7um. breve; segmentis dorsalibus subtus basin versus retractis ventralia, apice excepto, omninò abscondita: *fem.* abdomen breve, contractum, ovatum, supra et subtus convexum; segmenta 3um, et sequentia ad 6um. subæqualia; 7um. minimum;

[c] *μίσχος* petiolus, *γαστὴρ* venter.

segmenta ventralia nonnulla versus abdominis apicem conspicua; oviductus in carinula ventrali receptus, segmenti penultimi apicem versus apparens, non ultra abdomen exertus: pedes graciles, subæquales; tibiæ rectæ.

† *Stigma magnum.*[d]

Sp. 1. Misc. gibba. Fem. *Viridis, antennis nigris, clava graciliore, pedibus rufis, alis hyalinis.* (Alarum longitudo, 2 lin.)

June; grass beneath trees; near London.

Sp. 2. Misc. elegans. Mas et Fem. *Viridis, æneo variegata, antennis nigris, clava graciliore, pedibus rufis, alis subhyalinis.* (Alarum longitudo, 2—$2\frac{1}{2}$ lin.)

July; grass in fields; near London.

Sp. 3. Misc. rufipes. Mas et Fem. *Æneo-viridis, antennis nigris,* fem. *clava crassiore, pedibus rufo-fuscis, alis subfuscis.* (Alarum longitudo, $1\frac{3}{4}$—2 lin.)

August; grass in fields; near London. September; Isle of Wight.

Sp. 4. Misc. maculata. Mas et Fem. *Viridi-ænea, antennis nigris,* fem. *clava crassiore, pedibus rufo-fuscis, alis fuscis.* (Alarum longitudo, $1\frac{1}{2}$—$1\frac{3}{4}$ lin.)

June; grass in woods; near London. September; Isle of Wight. May; Southampton. New Lanark. Scotland.

Sp. 5. Misc. fuscipennis. Mas et Fem. *Ænea, antennis nigris,* fem. *extrorsum crassioribus, pedibus rufis, tarsis fuscis, alis fuscis, quàm* M. maculatæ *angustioribus.* (Alarum longitudo, 1 lin.)

June; grass in fields; near London.

Sp. 6. Misc. notata. Mas. *Viridis, præcedenti gracilior, abdomine æneo-viridi, antennis nigris, pedibus rufis, fusco cingulatis, alis subfuscis.* (Alarum longitudo, $\frac{3}{4}$—1 lin.)

August; grass in fields; near London.

Sp. 7. Misc. obscura. Mas et Fem. *Viridi-ænea, antennis nigris,* fem. *clava crassiore, pedibus rufis, femoribus viridi-*

[d] In the descriptions of the species of *Decatoma,* and of Var. δ. of *Megastigmus dorsalis,* p. 26—29, and 117, *for* "stigma," *read* "macula," and *for* "productum," *read* "producta."

æneis, alis obscurè fuscis. (Alarum longitudo, $1\frac{2}{3}$—$2\frac{1}{4}$ lin.)

July; grass beneath trees; near London. September; Westmoreland.

Sp. 8. Misc. fuscipes. Mas. *Æneo-viridis, antennis nigris, pedibus alisque fuscis.* (Alarum longitudo, $1\frac{1}{2}$ lin.)

August; grass in fields; near London.

Sp. 9. Misc. obscuripennis. Mas et Fem. *Viridis aut æneo-viridis,* M. fuscipede *gracilior, antennis nigris, clava crassiore, pedibus alisque fuscis.* (Alarum longitudo, $1\frac{1}{4}$—$1\frac{1}{3}$ lin.)

August; grass in fields; near London. September; Isle of Wight.

Sp. 10. Misc. antennata. Fem. *Æneo-viridis, antennis nigris, clava graciliore, pedibus viridibus, alis subhyalinis.* (Alarum longitudo, $1\frac{1}{2}$ lin.)

July; grass in fields; near London.

Sp. 11. Misc. maculipes. Fem. *Ænea, antennis nigris, clava crassiore, pedibus rufis, alis fuscis.* (Alarum longitudo, $1\frac{1}{2}$ lin.)

September; Isle of Wight.

Sp. 12. Misc. hortensis. Mas et Fem. *Viridis, antennis nigris,* fem. *clava crassiore, pedibus rufis, tarsis fuscis, alis fuscis.* (Alarum longitudo, 1—$1\frac{1}{2}$ lin.)

Halticoptera hortensis. *Curtis's Guide,* 118. 638. 7.

August; grass in fields; near London. September; Isle of Wight; Westmoreland.

Sp. 13. Misc. lucida. Mas. *Viridis aut cyaneo-viridis, abdomine viridi-æneo, antennis nigris, pedibus rufis, fusco cingulatis, alis hyalinis.* (Alarum longitudo, $1\frac{1}{3}$—$1\frac{1}{2}$ lin.)

August; grass in fields; near London. September; Isle of Wight.

Sp. 14. Misc. diffinis. Mas. *Viridi-ænea, abdomine subpetiolato, antennis nigris, clava crassiore, pedibus rufis, fusco cingulatis, alis hyalinis.* (Alarum longitudo, $1\frac{1}{4}$—$1\frac{1}{3}$ lin.

August; grass in fields; near London. New Lanark, Scotland.

†† *Stigma mediocre aut minimum.*

Sp. 15. Misc. chrysochlora. Mas et Fem. *Viridis, æneo variegata, antennis nigris,* fem. *clava graciliore, pedibus rufis, alis hyalinis.* (Alarum longitudo, $2\frac{1}{2}$—3 lin.)

Halticoptera chrysochlora. *Haliday. Curtis, Guide,* 118. 638. 1.

August, September; on box-trees and thistles; near London. Westmoreland. Mr. Wailes has taken it near Newcastle.

Sp. 16. Misc. annularis. Mas et Fem. *Viridis, antennis nigris,* fem. *clava graciliore, pedibus rufis, tarsis posticis fuscis, alis subhyalinis.* (Alarum longitudo, 2 lin.)

Halticoptera annularis. *Curtis, Guide,* 118. 638. 8.

September; grass in fields; near London; Westmoreland.

Sp. 17. Misc. viridis. Mas et Fem. *Viridis, antennis nigris,* fem. *clava crassiore, pedibus rufis, fusco maculatis, alis hyalinis, stigmate mediocri.* (Alarum longitudo, $1\frac{1}{4}$—$1\frac{1}{2}$ lin.)

August; grass in fields; near London. September; Isle of Wight.

Sp. 18. Misc. annulipes. Mas et Fem. *Æneo-viridis, antennis nigris,* fem. *clava crassiore, pedibus rufis, fusco cingulatis, alis subfuscis* mas, *aut fuscis* fem. (Alarum longitudo, 1 lin.)

August; grass in woods; near London. September; Isle of Wight.

Sp. 19. Misc. Scotica. Mas. *Viridis, antennis nigris, pedibus nigro-viridibus, alis fuscis.* (Alarum longitudo, $\frac{3}{4}$ lin.)

New Lanark, Scotland.

Sp. 20. Misc. ænea. Mas. *Ænea, antennis fuscis, pedibus fusco-rufis, alis fuscis.* Fem. *Cuprea, antennis nigris, clava crassiore, abdomine æneo aut viridi, pedibus viridi-fuscis.* (Alarum longitudo, $1\frac{1}{4}$—$1\frac{1}{2}$ lin.)

June; grass beneath trees; near London.

Sp. 21. Misc. tarsalis. Mas et Fem. *Viridi-aut cupreo-ænea, antennis nigris, pedibus rufis, fusco-cingulatis, alis subhyalinis.* (Alarum longitudo, $1\frac{1}{4}$—$1\frac{2}{3}$ lin.)

August; grass in fields; near London. New Lanark, Scotland.

Sp. 22. Misc. nitidipes. Mas. *Viridi-ænea, thorace cupreo, antennis nigris, extrorsum crassioribus, pedibus flavis, femoribus viridibus, alis hyalinis.* (Alarum longitudo, $1\frac{2}{3}$ lin.)
September; grass in fields; near London.

Sp. 23. Misc. breviventris. Mas. *Viridis, thorace cyaneo-viridi, antennis nigris, extrorsum crassioribus, pedibus flavis, fusco fasciatis, tarsis 4-posticis fuscis, alis hyalinis.* (Alarum longitudo, $1\frac{2}{3}$ lin.)
August; grass in fields; near London.

Sp. 24. Misc. lugubris. Mas. *Viridis, abdomine æneo-cupreo, antennis nigro-fuscis, pedibus flavis, tibiis intermediis apice nigris, alis subhyalinis.* (Alarum longitudo, $1\frac{1}{2}$ lin.)
August; grass in fields; near London.

Sp. 25. Misc. tenuicornis. Fem. *Viridis, antennis fuscis, pedibus rufis, 4 posticis fuscis, alis hyalinis.* (Alarum longitudo, $1\frac{1}{2}$ lin.)
August; grass in fields; near London.

Sp. 26. Misc. ovata. Fem. *Viridis, thorace æneo-viridi, antennis nigris, pedibus rufis, alis subhyalinis.* (Alarum longitudo, 2 lin.)
July; grass in fields; near London.

Sp. 27. Misc. nitida. Mas et Fem. *Viridi-ænea, abdomine æneo-cupreo, antennis nigris, pedibus rufis, alis subhyalinis.* (Alarum longitudo, $1\frac{2}{3}$—$1\frac{3}{4}$ lin.)
July; grass in fields; near London.

Sp. 28. Misc. cinctipes. Fem. *Viridi-ænea, abdomine cyaneo-viridi, antennis nigris, pedibus fuscis, femoribus viridibus, alis subhyalinis.* (Alarum longitudo, $1\frac{1}{2}$ lin.)
July; grass in fields; near London.

Sp. 29. Misc. nigro-ænea. Fem. *Ænea, abdomine nigro, antennis nigris, pedibus fuscis, alis subfuscis.* (Alarum longitudo, $1\frac{1}{4}$ lin.)
September; Isle of Wight.

Sp. 30. Misc. convexa. Mas. *Æneo-viridis, antennis nigris, quàm* M. annulipedis *gracilioribus, pedibus rufis, fusco cingulatis, alis subfuscis.* (Alarum longitudo, $1\frac{1}{4}$ lin.)

May; Southampton.

Sp. 31. Misc. apicalis. Fem. *Cyaneo-viridis, abdomine æneo-viridi, antennis nigris, pedibus rufis, nigro et fusco cingulatis, alis subfuscis.* (Alarum longitudo, 1 lin.)

August; grass in fields; near London.

Sp. 32. Misc. tumida. Fem. *Æneo-viridis, antennis nigris, pedibus fuscis, alis subfuscis.* (Alarum longitudo, $1\frac{1}{4}$ lin.)

August; grass beneath trees; near London.

Sp. 33. Misc. tristis. Fem. *Obscurè viridis, antennis nigris, pedibus rufis, fusco cingulatis, alis fuscis.* (Alarum longitudo, $1\frac{1}{2}$ lin.)

New Lanark, Scotland.

Sp. 34. Misc. dissimilis. Mas et Fem. *Viridis* mas, *aut æneo-viridis* fem., *antennis fuscis, pedibus rufis, fusco cingulatis, alis subfuscis.* (Alarum longitudo, 1—$1\frac{1}{4}$ lin.)

August; grass in fields; near London.

Sp. 35. Misc. semiaurata. Mas et Fem. *Aureo-viridis, abdomine æneo-viridi, antennis fuscis, pedibus flavis, fusco cingulatis, alis pallidè flavescentibus.* (Alarum longitudo, 1—$1\frac{1}{4}$ lin.)

August; grass in fields; near London. New Lanark, Scotland.

Sp. 36. Misc. costalis. Mas. *Cyaneo-viridis, abdomine æneo-cyaneo, antennis fuscis, pedibus flavis, fusco-cingulatis, alis fuscis.* (Alarum longitudo, 1 lin.)

July; grass in fields; near London.

Sp. 37. Misc. philochortoides. Mas. *Æneo-viridis, capite inter oculos impresso, abdomine æneo, antennis fuscis, pedibus flavis, fusco cingulatis, alis subfuscis.* (Alarum longitudo, $\frac{3}{4}$ lin.)

September; grass in fields; near London.

Sp. 38. Misc. cyanea. Mas. *Viridi-cyanea, abdomine nigro-cyaneo, antennis fuscis, pedibus flavis, fusco cingulatis,*

alis subfuscis, quàm M. philoch. *latioribus.* (Alarum longitudo, $\frac{3}{4}$ lin.)
July; grass in fields; near London.

Sp. 39. Misc. brevis. Mas. *Præcedentibus brevior, viridis aut viridi-ænea, abdomine nigro aut cupreo-viridi, antennis fuscis, pedibus flavis, fusco cingulatis, alis subfuscis.* (Alarum longitudo, $\frac{2}{3}$ lin.)
September; grass in fields; near London.

Sp. 40. Misc. contigua. Mas. *Viridis, abdomine æneo, antennis fuscis, pedibus flavis, fusco cingulatis, alis subhyalinis.* (Alarum longitudo, 1 lin.)
New Lanark, Scotland.

Sp. 41. Misc. linearis. Mas. *Cyaneo-viridis, antennis fuscis, pedibus flavis, fusco cingulatis, alis subfuscis.* (Alarum longitudo, $\frac{3}{4}$ lin.)

Obs.—Præcedenti gracilia; antennæ breviores; alæ angustiores.

August; grass in fields; near London. New Lanark, Scotland.

Sp. 42. Misc. filicornis. Mas et Fem. *Viridi-cyanea* mas, *aut viridis* fem., *abdomine nonnunquam viridi-æneo, antennis fuscis, pedibus flavis, fusco-cingulatis, alis hyalinis.* (Alarum longitudo, $\frac{3}{4}$—1 lin.)
August; grass in fields; near London.

Sp. 43. Misc. femorata. Fem. *Viridis, antennis nigris, pedibus rufis, fusco-cingulatis, alis hyalinis, stigmate minimo.* (Alarum longitudo, 1—$1\frac{1}{8}$ lin.)
August; grass in fields; near London.

Genus XIII. Micromelus,[e] *Walker.*

Caput præsertim in *maribus* magnum, thorace latius: oculi mediocres: *maris* antennæ 13-articulatæ, extrorsum crassiores; articulus 1us. elongatus; 2us. elongato-cyathiformis; 3us. et 4us. minimi; 5us. minutus; 6us. et 4 sequentes æquales, lineares; clava triarticulata, elongato-ovata, apice conica, articulis 9°. et 10°. æqualis: *fem.* antennæ subclavatæ; articulus ultimus setiformis: mandibulæ arcuatæ; una tridentata; altera quadridentata: maxillæ elongatæ, angustæ: palpi maxillares triarticulati,

[e] *μικρὸς* parvus, *μέλος* membrum.

breves, filiformes; articulus 1us. brevis; 2us. longior; 3us. 2°. longior, acuminatus: mentum elongatum, angustum, posticè conicum: labium breve, anticè rotundatum: palpi labiales 2-articulati, breves: thorax ovatus: prothorax parvus: mesothoracis scutum breve, suturæ vix conspicuæ; scutellum magnum, latum; paraptera magna: metathoracis scutellum magnum: petiolus brevissimus: *maris* abdomen latum, ferè rotundum, supra minimè convexum, subtus planum; segmentum 2um. elongatum; 3um. brevius; sequentia brevissima: *fem.* abdomen ovatum, supra convexum, subtus carinatum; pedes graciles; tibiæ rectæ.

Sp. 1. Micr. rufo-maculatus. Mas et Fem. *Viridis aut viridi-æneus, abdominis disco rufo, antennis fuscis, pedibus rufis, alis subfuscis aut hyalinis.* (Alarum longitudo, $\frac{2}{3}$—1 lin.)

June; grass in fields; near London. New Lanark, Scotland.

Sp. 2. Micr. pyrrhogaster. Mas et Fem. *Viridis aut viridi-æneus, abdomine rufo, apice nigro, antennis fuscis, pedibus rufis, alis vix ullis.* (Corporis longitudo, $\frac{1}{2}$—1 lin.)

Pteromalus pyrrhogaster. *Haliday. Curtis' Guide.*

Grass in fields; throughout the year; near London. New Lanark, Scotland.

Genus XIV. Isocyrtus,[f] *Walker.*

Caput magnum, thorace multò latius: oculi mediocres: antennæ 12-articulatæ, subclavatæ, thorace breviores; articulus 1us. vix elongatus; 2us. cyathiformis; 3us. et 4us. minimi; 5us. et sequentes ad 10um. æquales; clava triarticulata, elongata, apice conica, articulis 8°. et 9°. paullò longior: thorax elongatus: prothoracis scutellum mediocre: mesothoracis scutum magnum, suturæ laterales indistinctæ; paraptera et epimera benè determinata; scutellum magnum, convexum: metathoracis scutellum conspicuum, supra carinatum: petiolus brevis: abdomen elongato-ovatum, supra depressum, subtus carinatum, apice acuminatum; segmenta 2um. et 3um. magna; sequentia parva: pedes subæquales, graciles; tibiæ rectæ.

[f] *ἴσος* æqualis, *κυρτὸς* curvus.

Sp. 1. Isoc. lætus. Fem. *Viridis, abdomine purpureo, antennis nigro-fuscis, pedibus flavis, alis subhyalinis.* (Alarum longitudo, $1\frac{3}{4}$ lin.)

August; grass in fields; near London.

Genus XV. Spaniopus,[g] *Walker.*

Caput mediocre, thorace latius: oculi mediocres: antennæ 13-articulatæ, extrorsum crassiores; articulus 1us. elongatus; 2us. cyathiformis; 3us. et 4us. minimi; 5us. et sequentes ad 10um. subæquales; clava triarticulata, elongata, apice acuminata, articulis 9°. et 10°. longior: thorax elongato-ovatus: prothoracis scutellum parvum: mesothoracis scutum magnum; suturæ laterales satis conspicuæ; paraptera et epimera majuscula; scutellum convexum, ovatum: metathoracis scutellum magnum: petiolus brevissimus: abdomen breve, ovatum, supra depressum; segmentum 2um. magnum; 3um. mediocre; sequentia parva: pedes graciles; tibiæ rectæ, intermediæ apice incrassatæ.

Sp. 1. Span. dissimilis. Mas. *Aureo-viridis, antennis fuscis, pedibus stramineis, alis flavotinctis.* (Alarum longitudo, 1 lin.)

August; grass in fields; near London.

Art. LVIII.—*Abstract of M. Straus-Dürckheim's "Considerations Générales sur l'Anatomie Comparée des Animaux Articulés."* By Edward Doubleday, Esq.

(*Continued from* p. 283.)

"Quelle admirable structure, quelle sagesse, quelle toute-puissance dans le moindre objet sorti des mains du Créateur!"

Part. I.—Tegumentary System.

Section I.

In all the *Annelida*, and in the greater part of the larvæ of insects, the skin still preserves that flexibility which it possesses in the *Vertebrata;* consequently, the skeleton being wanting, their bodies are soft and more or less cylindrical, and their motions confined to crawling or swimming; but Nature, wishing to introduce in the more perfect articulated animals many of the functions of the *Vertebrata*, has, by increasing the proportion of earthy substances in the skin, given it nearly the consistence of bone, whilst, by means of

[g] σπάνιος rarus, πούς pes.

articulations in different directions, it retains a sufficient degree of flexibility. This constitutes the chief difference between the teguments of vertebrate and articulated animals, although the armadillos in the former offer a similar example of an ossified skin.

In the *Annelida abranchia*, especially in the genus *Hirudo*, the skin presents the same structure as in the *Vertebrata*, except that the papillary tissue is apparently wanting; the mucous matter,[a] which is very abundant and nearly fluid, is placed immediately beneath the corneous and nearly colourless *epidermis;* the *dermis* is a very thick membrane, of a close texture, formed of fibres irregularly transverse to the direction of the body; it appears to consist of but one layer.

In the genus *Limulus* the teguments consist of two *lamina*, easily separable; the first, corneous, brown, thick, analogous to the *epidermis;* the second, analogous to the *dermis*, still thicker, of a pale yellowish colour, corneous, but of a less compact structure than the first: beneath this is a copious black mucous matter.

In insects the teguments consist also of three layers, as in the *Annelida* and *Limulus*, but they present peculiar characters. The mucous, or more properly the colouring matter, is composed of two separate substances; the one soluble in alcohol, forming in many insects, especially the *Coleoptera*, the outer layer, giving those brilliant colours with which many are adorned; the other, not soluble in alcohol, generally of a brown or blackish hue, is mostly contained in the tissue of the *dermis* and *epidermis*. In *Coleoptera* the *epidermis* forms the second layer of the teguments; is thin, hard, brittle, friable, and without any trace of fibres; its colour is generally black or brown. The *dermis* consists of many distinct layers, easily separable, composed of fibres more distinct in proportion as the layers are more internal. The *dermis* is paler than the *epidermis*, being brownish or white.

The internal prolongations of the teguments appear to be formed by the *dermis*, intermixed with a small quantity of the colouring matter.

The colouring matter is found sometimes between the

[a] I use the term mucous *matter*, as employed by M. Straus, in preference to *rete mucosum*, because I conceive the latter term hardly applicable to an almost fluid substance as this is in insects.—D.

epidermis and *dermis*, sometimes beneath the last, and is sometimes external, as may be seen in the *Libellulidæ*. The *Arachnida* exhibits a similar structure.

In the *Onisci*, the teguments, from the large quantity of calcareous matter they contain, have become hard and brittle; the *epidermis* and *dermis* are not distinct, and present no trace of fibres; they are colourless, and only owe their appearance of being coloured to the mucous matter which is internal. The decapod *Crustacea* in general only differ from the *Onisci* in having the colouring matter external: in the articulations the colouring matter is wanting, and the *epidermis* and *dermis* are distinct.

At certain epochs, variable according to the species, the articulated animals change their skins, precisely as do the snakes. Those with soft teguments, as the *Annelida*, only renew the *epidermis*, whilst those whose teguments are solid renew also the *dermis*. The internal prolongations of the *dermis*, from their situation, cannot be renewed in this manner; the calcareous matter is, therefore, merely absorbed at the time of the change, and re-deposited after it.

The teguments of articulated animals differ much from those of the *Vertebrata* in their component parts; they even differ in the different families.

According to the analysis of M. Odier, the elytra of *Melolontha vulgaris* consists of *albumen*, an extractive matter, soluble in water; a brown animal substance, soluble in a solution of potass, but not in alcohol; a coloured oil, soluble in alcohol; a peculiar matter (chitine), forming one-fourth of their weight; sub-carbonate of potass; phosphate of lime; and phosphate of iron. Chitine is insoluble in potass, is soluble in hot sulphuric acid, does not turn yellow with nitric acid, burns without melting, and does not contain azote.

The teguments of the common crab (*Cancer pagurus*) are composed of

Chlorure of sodium and salts of soda . . .	1·6
Phosphate of lime	6·0
Phosphate of magnesia	1·0
Carbonate of lime	62·8
Water and animal matter	28·6
	100·0

In the lobster (*Astacus marinus*) the proportion of carbonate of lime is less, and of animal matter and water greater. The proportions of the other component parts do not differ much.

In the more perfect *Vertebrata*, the skin, being merely intended to protect the parts beneath from the immediate contact of external objects, presents merely a layer uniformly spread over the whole body; but, in the articulated animals, the teguments, having to perform the functions of the skeleton, exhibit many internal prolongations and articulations necessary for the new uses to which they are destined. In the fishes, the skin sends off internal prolongations at different distances, which serve for the attachment of the muscles of the trunk; these, in the genus *Ammocætes*, corresponding to faint transverse folds of the skin, cause the body to appear articulated. The *Annelida abranchia* (*Cryptobranchia*) offer the same appearance; but in the other *Annelida*, the folds of the teguments are more distinct, and we find appendages serving as locomotive organs, furnished with muscles, and articulated. The *Myriapoda* have the teguments solid, the feet fully developed, furnished with numerous muscles, and internally the teguments are produced into many *apophyses* to which these muscles are attached.

Lastly, in *Insecta*, *Crustacea* and *Arachnida*, the teguments acquire all the development of which they are susceptible, and become as complicated as the skeleton of *Vertebrata*.

The *Annelida abranchia* have the body composed of a greater or less number of segments, nearly similar, and without any distinct head; but in the others (*Gymnobranchia*) the first segment becomes a true head, bearing eyes more or less distinct, and *tentacula*. In some species the head is composed of many segments united, the first prelude of its more perfect organization in the following groups. The body of some *Annelida* is divided into two parts, one bearing *cirrhi*, which might be considered as the trunk, the other without *cirrhi*, representing the abdomen; but this distinction is very uncertain, as in some it is the posterior, in others the anterior segments which bear the *cirrhi*. In the *Myriapoda* the body is composed of segments uniformly or alternately similar; the head is composed of several segments united. Insects have the body divided into eleven, twelve, or thirteen[b] segments,

[b] Evidently wrong; the true number being always thirteen, including the head.—D.

besides the head. In the *larvæ* they are, as in the *Myriapoda*, nearly similar; but they undergo great changes in the *metamorphosis*, becoming divided into four principal parts, namely, the head, the corselet (*prothorax*), the *thorax*, and the *abdomen;* the first and two last are also composed of more segments than one, united. It appears, from a comparison of the head of *Coleoptera* with that of the *Scolopendra morsitans*, that the head of insects is formed by a union of seven segments, represented by the *labrum*, *clypeus*, *epicranium*, and *mandibulæ*, *labium*, *prebasilar*, and the two last by the *basilar*, of which the appendages form the *maxillæ*. Perhaps the *labrum* or *clypeus* forms part of the segment to which the *labium* belongs, and the *epicranium* may also be part of the segment of which the *prebasilar* forms part; in this case the head consists but of five segments.[c]

The *Crustacea* present more numerous modifications in the form of the body, and less sudden transitions from one genus to another, than the *Myriapoda* and insects; and here, as well as in the *Arachnida*, the change of the feet to organs of manducation is so clear as to leave no room for doubt. Many genera of the *Isopoda* have the body similarly formed to the *Myriapoda*, except that the last segments undergo some modification on account of the change of the feet into respiratory organs. The head is distinct, and probably composed of several segments. In the *Amphipoda* the posterior segments diminish in bulk, marking out the distinction between the trunk and abdomen, which becomes complete in the *Decapoda*, where the segments of the trunk are intimately united, and where the anterior segments constitute a head confounded with the trunk, whilst the posterior remain moveable, diminishing gradually from genus to genus until they are reduced to mere rudiments in the *Brachyura*. Lastly, in *Limulus*, the head has disappeared, and the food is masticated solely by the feet. The body is divided into two segments, the trunk and abdomen; but the distinction of their respective segments is scarcely visible, except the last, which is styliferous. We now arrive at the *Arachnida*, the organization of which in general nearly resembles that of *Limulus*. The body is composed, according to the families, of two or three parts. In *Thelyphonus* the trunk bears the members and the mouth;

[c] Certainly not a correct view of the structure of the head.—D.

the abdomen has the segments distinct, and terminates in a tail, which, being articulated, appears to be the last rudiment of a series of segments in a state of atrophy. In *Phrynus* and *Galeodes* the body is formed of but two parts; in the last the segments are apparent, but they are not so in the rest of the *Arachnida*. In *Mygale* the *maxillæ*, with their *palpi*, differ only from the feet in size, but in the other genera the transformation is more complete. Nature, wishing to give insects the faculty of flying, as in birds, necessarily changed considerably the general form of the body from that of the *Myriapoda*, their nearest allies. This new function required that the thoracic segments should be shortened, but at the same time increased in width, and also that the motion of the aliferous segments should be very small or even none. There is a striking resemblance between these changes and those which we find in comparing the skeleton of birds and *Mammalia*.

We find, amongst the articulated animals, ten kinds of articulations of the teguments:—

1. The *suture*, which is always harmonic, is precisely the same as in the *Vertebrata*.

2. An articulation (to which M. Sträus gives the name of *adhérence*) formed by the close union of two parts by their faces.

3. *Symphysis*, which is only a suture in which there exists a slight movement.

4. An articulation, which may be termed *linear*, takes place between two parts usually flat, touching by a straight margin, and united by a ligament, which only allows a ginglymous movement.

5. An articulation, which may be termed *syndesmoidal*, only differing in the ligament being very wide, which permits a movement in every direction, but chiefly ginglymous.

6. We may give the name of *squamose* to syndesmoidal articulations, where one of the portions is so placed as partly to cover the other.

7. *Enarthrosis*, which resembles the same kind of articulation in the *Vertebrata*, except that the soft parts in the articulated animals being internal, the condyle is mostly perforated to allow of the passage of the nerves and vessels.

8. An articulation, only differing from the last in the fact that

the extremity of the one part is not received by a cavity of the other, being simply united by a circular dermoid membrane. (M. Straus terms this *Articulation à têtes disjointes*.)

9. *Ginglymus*, where there exists but a motion in one direction, as that of a hinge.

10. Two solid parts are sometimes separated by a space so thin as to permit a greater or less degree of motion to the two solid portions. This, which though equivalent to, cannot be considered as, a real articulation, may be termed, *movement by flexion*.

Section II.

Structure of the Teguments in Melolontha vulgaris.

In the last section I have endeavoured to give a much fuller and more regular abridgement of our author than it is my intention to do in the present one; but my friend, Newman, being now engaged in elucidating the external anatomy of insects, it would be occupying too much of your Magazine with one subject, were I to venture much on the same ground with him; and, moreover, some one, knowing how far more able he is than I am to undertake such a subject, might remind me of Boileau's lines:—

> Un âne, pour le moins instruit par la Nature
> A l'instinct qui le guide obéit sans murmure,
> Ne va point follement de sa bizarre voix,
> Défier aux chansons les oiseaux de la bois.

I shall, therefore, confine myself to pointing out M. Straus's terminology of the different parts, in as few words as possible, just noticing any of his remarks calculated to throw light on the subject of systematic arrangement. I had intended to give also Kirby's nomenclature of the different parts; but, on a re-examination of the third and fourth volumes of his Introduction to Entomology, I found so much confusion in the nomenclature, a certain indistinctness and unintelligibleness in the plates, that, fearful of misleading, I almost entirely gave up this idea. I trust, however, that this subject has now fallen into the hands of one who will not abandon it until he has furnished us with a clear and intelligible nomenclature; every one who has consulted works giving detailed characters, particularly Mr. Curtis's, in which the dissections are so beautiful and accurate,

must have been struck with the total want of uniformity and intelligibility in the nomenclature.

The head, according to M. Straus, may be considered to consist of several parts; one, all the parts of which are fixed, he calls the *cranium;* the others are the moveable parts; namely, the *antennæ*, and parts of the mouth.

The *cranium* is composed of four parts, which he terms, *epicrâne*, *chaperon*, *pièce basilaire*, *pièce prébasilaire*, and of the two *corneæ* of the eyes.

The *pièce prébasilaire* is that part immediately behind the *labium;* its form is an elongate trapezium: the *pièce basilaire* is placed immediately behind this, reaching from it to the *foramen occipitale;* internally, its anterior margin offers two *apophyses*, to which the *maxillæ* are articulated. The *chaperon* (*clypeus* of Fabricius) is the part immediately behind the *labrum;* the remainder of the *cranium* is the *epicrâne*, or *pièce epicrânienne* of our author. On its sides, near the anterior margin, are fixed the *corneæ* of the eyes; and immediately in front of these is a small opening, in which are articulated the antennæ. The *epicranium* is prolonged inwards, beneath the eyes, so as merely to leave an opening for the passage of the optic nerve. Near each antenna is a long internal *apophysis* connected with that of the *pièce basilaire.*

The *maxilla* he divides into four parts, besides the *palpus* and *galea.* The first piece is Kirby's *cardo*, which he calls *branche transverse.* The second is the *pièce dorsale;* to the internal margin of which is articulated the third, the *intermaxillaire.* The fourth, *pièce palpifère*, occupies the upper surface of the *maxilla*, contiguous to the mandible: it is nearly triangular, articulated by its external margin to the *pièce dorsale.* The *galea* is the part termed, by MacLeay, the outer lobe. There is little new in his description of the other parts of the mouth and of the antennæ.

Our author gives the name of *pièces jugulaires* to two consecutive plates contained in the inferior part of the skin of the neck, and uniting the head to the *prothorax.* The first, or *jugulaire antérieure*, is articulated by a small condyle at its extremity to a tubercle placed on the internal side of the hinder *apophysis* of the *pièce basilaire.* At its opposite extremity it is articulated to the second, or *jugulaire postérieure;* and this

last is articulated to the anterior *apophysis* of the *sternum* of the *prothorax* [d] (*corselet*).

These parts, which always are two in number on each side, in the *Coleoptera*, are the last remains of two segments, which have disappeared between the head and *prothorax* (corselet).

In *Forficula* they form two small rings surrounding the neck. They are also very distinct in *Blatta* and the *Orthoptera*.

M. Straus-Dürckheim, without assigning any reason for the change, has altered the names usually given to the three segments, included by Kirby under the general name of *truncus;* calling the *prothorax* the *corselet,* the two remaining ones, when taken together, the *thorax;* and, when separately, the *prothorax* and *metathorax*. But, in order to avoid confusion, I shall uniformly adhere to the received terms; because, I conceive, a name once given, ought only to be changed on the ground of its being inapplicable.[e]

The whole upper part of the *prothorax* is occupied by a large convex plate, (*le bouclier*), which curves laterally, and inwards, until it meets the *prosternum*. The anterior part of the lateral margin unites with the *alæ* of the *prosternum;* and, posteriorly, the same margin is prolonged into a strong *apophysis*, (*apophyse scuto-sternale,*) which unites with the *prosternum:* between this *apophysis* and the *alæ* of the *prosternum* is a large opening, in which is placed the leg. The *prosternum* (*sternum antérieur*) occupies the lower part of the *prothorax;* it presents a central part and two pairs of lateral *apophyses;* one of which, the *alæ* of the *prosternum*, forms part of the external envelope of the *prothorax*, uniting the *prosternum* by its anterior part to the *bouclier*. From the union of these, and that of the scuto-sternal *apophyses* with the *prosternum*, arises the apertures mentioned above. The lateral margins of the *prosternum* are prolonged into these

[d] Not of M. Straus; his *prothorax* is what is commonly called the *mesothorax*. —Ed.

[e] It is much to be regretted that so able an author should, by substituting new names for those previously given, without any reference to the former ones, have induced so much confusion that even that great entomologist, whose death we have lately had to deplore, was compelled to own that he could not unravel it. I trust that should I (who even amongst the least of your correspondents may be said merely *argutos inter strepere anser olores*) fail in making myself so clearly understood as I could wish, your readers will pardon me, or only blame my rashness, in attempting a task so far above my abilities.

apertures, so as partly to cover the internal side of the *coxæ*. From this prolongation arises, on each side, a stout, broad, but short *apophysis*, forming the second pair spoken of above. These may be named the "*anterior episternal apophyses.*" Two small pieces placed within the *thorax*, and articulated to the *coxæ*, are called the *rotulæ*. They are nearly triangular; very convex on the interior surface; the posterior margin is straight, and articulated with the corresponding margin of the opening of the *coxa;* the opposite side is nearly circular, with a small notch fitting a crescent-shape projection of the *bouclier*, upon which these parts move; whilst at the same time they fix indirectly the *coxa* to the *bouclier*. Two corneous rings, of an elongate-oval form, suspended in the membrane, which unites the *prothorax* to the *mesothorax*, near to the scuto-sternal *apophyses*, surround the *stigmata*, and are termed the "*cadres des stigmates.*"

The *prothorax* of *Coleoptera* varies much in different genera: that of *Forficula* is intermediate between that of *Coleoptera* on the one hand, and of the *Lepismæ* and *Scolopendræ* on the other; the upper part resembling the former—the lower, the latter. Though differing much from the *prothorax* of *Coleoptera*, it resembles it much more than that of the *Orthoptera*. The structure of the legs is so well known, as to render it needless for me to say more, than that our author uses the terms commonly employed by French writers.

The *mesothorax* is, in *Coleoptera*, generally one-half smaller than the *metathorax;* as the *elytra*, not being much used in flight, do not require such powerful muscles as the wings. It is composed of fourteen parts, besides several small ones connected with the *elytra*, (*proalæ*, Newman). The upper surface consists of a triangular slightly convex piece, (*l'ecusson*); the anterior part of which is emarginate; but the emargination is filled by an almost membranous plate, (*le limbe de l'ecusson*). Another triangular plate occupies about two-thirds of the anterior part of the lateral margin—is directed downwards, and terminates in two slender *apophyses*. This is called the "*lateral apophysis*" of the *ecusson;* the two branches are the anterior and posterior *cornua*, (*cornes antérieure et postérieure*).

In some *Coleoptera* these are separated from the body of the *apophysis*, and may then be called the "anterior scapulars."

What is commonly called the *ecusson*, (*scutellum*), is merely a portion of this part, which is elevated, and visible between the *elytra*. The external margin of the "*limbe*," and the base of the lateral *apophysis* of this part, are united by a small horizontal and triangular plate, to which is attached the long extensor muscle of the *coxa* of the second pair of legs. A small thread-like part, arising from the anterior angle of the *ecusson*, and united to the first "*pièce iliaque*," is the anterior clavicle.

The lower part of the *mesothorax* is occupied by the *mesosternum*, (*sternum moyen*), which in many *Coleoptera* is so closely united to the *metasternum* as not to leave the least trace of a suture. Its form is similar to that of the *prosternum*, offering a central part and two *alæ*, with an internal *apophysis* (*episternale moyenne*), corresponding in its situation to the anterior episternal. On each side of the *mesothorax* is a tetragonal plate, composed of two parts; the first of which, the first *ilium*,[f]) (*première pièce iliaque*), is united below to the *alæ* of the *mesosternum*, and above to a membranous space in which the *elytra* are fixed. The second *ilium* is united to the first by its anterior margin; its inferior margin closes laterally the opening of the *mesosternum*, which receives the *coxa* of the second pair of legs; behind it is united by a membrane to the *metathorax*, and above, to the same membranous space as the first *ilium*. At the point of union between the first and second *ilium*, is a short *apophysis*, formed by a fold of their margins, to which is articulated the *coxa*. Superiorly, this fold is prolonged, and continued with the anterior margin of the first *ilium*, sending forth two *apophyses;* one (*apophyse transverse des iliaques*) directed inward, forward and downward, serving for an attachment to many muscles; the other (*apophyse alifère du prothorax*), shorter, horizontal, serving as the point of articulation of the *elytra*. The second pair of *stigmata* are placed in the second *ilium*, but are not visible externally. In the supra-anterior part of the cavity, which receives the *coxa*, is a moveable piece, analogous to the *rotula* of the *prothorax*. The *elytra* present, near the middle of their anterior margin, a strong bifurcate *apophysis*, receiving

[f] Not an appropriate name; for can we fancy any analogy between parts of the *mesothorax* and *metathorax* of insects and the *ossa innominata* of the higher animals?—D.

between its two divisions the external branch of the aliferous *apophysis*. Besides this direct articulation, each *elytron* articulates indirectly with the "*ecusson*" and first *ilium* by four small moveable pieces; one (*préépaulière*), placed in front of the bifurcate *apophysis* of the *elytra;* the others, (*epaulières antérieure, moyenne, et postérieure*), placed behind the same *apophysis*. Their situation and structure can only be learned by a very careful examination of the animal itself.

The *metathorax* is formed of eighteen parts, ten of which have their analogues in the *mesothorax*. Its under surface is occupied by a *sternum* resembling that of the *mesothorax*, but double its size; its wings are rhomboidal, and extend from the *mesothorax* to the *coxæ* of the last pair of legs (*metapedes*, Newman), to which they are united by a squamose articulation. The lateral angle of these wings presents a small *apophysis*, on which are articulated, on one hand, the *coxæ* of the *metapedes*, and, on the other, the second *ischium*. On the medial line of the *sternum* (*metasternum* of authors) rises a stout vertical plate, terminated by three long *apophyses*, one directed forward, the other obliquely, outward and upward. The vertical plate is the posterior episternal *apophyses;* the branches are its anterior and lateral *cornuæ*.

On each side of the *mesothorax* are two parts analogous to the *ilia*, but differently formed; these are the *ischia*, or *pièces ischiatiques*. The second *ischium* is a flat semi-oval plate, placed above the wing of the *metasternum*, occupying its whole width, and united to it by a squamose articulation. Its upper margin is united to the first *ischium*, which is of a very irregular form, presenting behind a quadrangular external part placed on a level with the second *ischium;* to which it is united by its inferior margin; posteriorly, it borders upon the hinder *coxa;* above, it partly covers the membranous band of the first segment of the *abdomen*, (*propodeon*, Newman); its anterior part is united to the *pièce costale*. Its antero-inferior angle is prolonged into a narrow band, bounding the upper margin of the second *ischium* for about two-thirds of its length, when it rises, and forms a long *apophysis*, (*alifère postérieure*,) directed upwards, forward, and inwards, serving to support the wing.

The costal (*pièce costale*) is an almost membranous plate,

situated above the first *ischium*, occupying the space between its posterior angle and the posterior aliferous *apophysis*. In the interior of the *mesothorax* are two parts, resembling, in form, the bell of a trumpet. These, which are in fact merely the tendons of certain muscles, are called the *cupules* of the wings. The first, (*grande cupule de l'aile*,) is situated at the anterior part of the first *ischium*, and receives the anterior extensor muscle of the wing;—the second, (*petite cupule de l'aile*,) is placed at the posterior part of the *pièce costale*, and receives the posterior extensor muscle of the wing.

The upper part of the *metathorax* is formed by a large very convex piece, (*clypeus*,[g]) which is however, in reality, formed of seven parts; one only of which is distinct in the *Melolonthæ;* and in most of the *Coleoptera* their sutures are scarcely visible. In the other orders they are not to be traced. In this insect the *clypeus*, which occupies all the upper part of the *metathorax*, is nearly a trapezium, of which the larger parallel side is foremost, emarginate in the middle, forming, in part, a large opening closed by a thin transparent membrane, (*la toile*.) The upper surface of the *clypeus* is marked by a deep channel, (*gouttière mediane*,) throughout its whole length; its anterior margin, on each side of its emargination, forms a very projecting tubercle; in front of which, forming the antero-lateral angle of the *clypeus*, is the *axillifère*. The *diaphragme* is a large trapezoidal piece, curving obliquely downwards, and partly separating the *mesothorax* from the *metathorax*; at each of its anterior angles is a small rounded piece analogous to the clavicle of the *mesothorax*,—hence this may be termed the posterior clavicle. Two triangular pieces, placed one on each side of the *clypeus*, near the posterior angles, are the posterior scapulars.

The name *tergum*, or *pièce tergale*, may be given to a large triangular plate, which descends from the posterior margin of the *clypeus* and of the scapulars into the interior of the body, to furnish an attachment to many muscles, and also to separate the *abdomen* from the *metathorax*. The wings are articulated to the *metathorax* by means of five parts analogous to the

g This name cannot with propriety be applied to this part, having been given by Fabricius to a totally different part. M. Sträus is too much disposed to overlook what has been done by others.

préépaulière and *épaulières* of the *mesothorax*. The first is termed *préaxillaire;* the others *première, seconde, troisième,* and *quatrième axillaire.*

The *mesothorax,* and *metathorax,* of the other *Coleoptera,* offer but little different from that of the *Melolonthæ;* but there are modifications which may be pointed out as serving to throw light on the subject of classification and comparative anatomy. In *Forficula,* the *thorax*[h] is much nearer in form to that of *Lepisma* than to that of *Coleoptera* or *Orthoptera,* differing most, however, from that of the last order. In fact, it is precisely intermediate between that of *Lepisma* and *Staphylinus.* In *Staphylinus olens,* the seven pieces which form the *clypeus* are separated by very distinct sutures. In the Apterous *Coleoptera* the absence of wings causes considerable difference in the form of the *thorax.* The membranous space in which the wings are inserted is wanting, or, rather, is filled by the greater development of the neighbouring parts; the *tergum,* which is curved inwards where the wings exist to serve as an attachment for the muscles, now regains its primitive form, as the upper portion of the first abdominal segment. Lastly, the upper surface of the *metathorax* becomes membranous; and the different parts of which it is composed no longer present the different *apophyses* which were necessary in the winged species.

The *abdomen,* bearing no external member which can influence its structure, its segments take the most simple structure possible,—each, with the exception of the first, being merely composed of two principal parts, one superior, the other inferior, united by a membranous space, becoming less and less wide towards the extremity. This allows the *abdomen* to dilate, or contract according to the state of the *viscera.*

EDWARD DOUBLEDAY.

[h] In this instance and another, seven lines below, our correspondent has applied this term to the *meso-* and *metathorax,* united; in all other instances he has made his names conform with those of Mr. Newman, at p. 394.—ED.

(To be continued.)

Art. LIX.—*Essay on the Classification of Parasitic Hymenoptera, &c.* By A. H. Haliday, Esq. M.A.

(*Continued from page* 350.)

Of the Ichneumones of the Second Line, (Ichneumones adsciti, *Essenbeck.*)

The authors who have treated of the family at large are enumerated and noticed in detail by Professor Gravenhorst, in the Prolegomena to his History of European *Ichneumones*. It was not till the year 1811 that this supplemental branch was distinguished from the proper *Ichneumones*, by Doctor Nees Von Essenbeck, whose system is more fully unfolded in the ninth volume of the New Series of Transactions, published by the Imperial Academy of the Physical Sciences,[a] and has been followed by modern entomologists with few exceptions. That of Spinola, which Latreille adopted, and has adhered to in his latest works, differs in result (as detailed by them) from that first mentioned, only as respects the position of the genus *Agathis*, whose affinity to the *Bracones* is admitted by Latreille himself.[b] But, accurately examined, this method will be found to fail, as the variations of the *palpi* (on which it is founded) are much more extensive than those it comprehends. That of Von Essenbeck is therefore as superior in certainty as it is in facility of application; while the few Apterous species[c] are, by their habit, easily assigned to their proper station in the family. He has, however, employed the principle of Spinola for the distinctive characters of his secondary groups, the *Bracones* and *Bassi*, a division which is accordingly defective in a similar degree. The difficulty of applying such a test appears from the fact that this most accurate observer has made glaring transpositions,[d] even among the genera strictly reducible to the lines of his own method. Professor Fallen, in a recent Essay, while he adopts the primary division of Von Essenbeck, has rejected these minor groups; but, in reducing the number and extending the

[a] Nova Acta Phys.-Med. Acad. Cæsar. Leop. Carol. Nat. Curios.

[b] Règne Animal, N. E. Tom. V. p. 288.

[c] I am acquainted with but two, *Aphidius Ephippium* and *Alysia aptera*.

[d] *Cælinius, Spathius, Hormius, Blacus, Perilitus.*

limits of the genera, has produced an arrangement which seems less simple and natural. Of the genera, seven[e] had been previously established (but not all equally well defined) by Fabricius, Latreille, Schranck, and Jurine; the rest we owe to the labours of the same accomplished naturalist, who has besides described at length a considerable number of the European species; of which, also, several will be found dispersed among the Fabrician genera, and more collected and arranged in the Ligurian Fauna of Spinola. Seven species only are noticed by Linné; two of which are placed among his *Ichneumones majores*, four with the *minuti*, and one is appended to the genus *Cynips*. The little that is known of their instincts and economy is to be sought in the pages of Reaumur, and of the incomparable Swede, in patient observation almost *his* equal, and in his systematic views (may I not say) unrivalled among his contemporaries. A few of the more familiar species have also been figured, and their habits noticed, by some of the older writers upon insects, as Madame Merian, Frisch, &c.; and some interesting contributions to their history, in recent publications, are to be consulted under their respective heads.

As the general form is similar throughout the family, the second chapter of Gravenhorst's Prolegomena may be referred to for an elaborate account of the external anatomy. I shall merely allude to some characters which pervade the present branch, reserving the consideration of other distinctions for the minor groups to which they are confined. In general it may be remarked, that these exhibit greater variety in the details than exist among the proper *Ichneumones:* the defined white or yellow markings there so prevalent are wanting here; the white ring of the *antennæ* is also excluded from the characters of the group, by Von Essenbeck; but I am acquainted with one instance where the female has such a distinction.[f] In the upper wings the exterior areolet of the disk is always open, the anterior is mostly complete, which is never the case in the others; the cubital area is usually of more uniform breadth, and the second areolet of moderate or ample dimensions; sometimes that area is contracted in the middle, and

[e] *Agathis, Bracon, Sigalphus (Sphæropyx), Microgaster, Chelonus, Incubus (Aphidius), Alysia.*

[f] *Rogas dispar.* Hal.

this areolet becomes very minute. Of the lower wings, also, the nervures are disposed after a peculiar type, to which, among the proper *Ichneumones*, *Porizon* and some of the *Cremasti* make an approach; a few have two radial areolets, some also two cubital, and, in one extensive group, the commencement of a complete discoidal areolet beyond the second brachial is traced by a recurrent nervure.

Their habits, so far as ascertained, present no broad distinction from the rest of the family. I am not aware that any of them are hyperparasitic; but in their earlier states they are themselves obnoxious to the attacks of certain of the proper *Ichneumones*, of the *Chalcides*, and the *Oxyuri*. For their transformation, the majority enclose themselves in a silky cocoon; this is dispensed with in a few instances, where the nature of their nidus renders such a protection unnecessary.

Tabula Synoptica.

Abdomen
- sub pectus incurvatile . . . . . APHIDINI.
- haud incurvatile: *Areola disci antica*
  - contigua completa . . . . . SIGALPHINI.
  - remota s. incompleta: *brachialis posterior alarum posticarum emittens*
    - nervum unicum BRACONII.
    - nervos binos . AGATHENSES.

Tribus 1.—APHIDINI. *Haliday.*

Complectitur genus unicum.

GEN. I.—APHIDIUS. *Essenbeck.*

Incubus. *Schrank.*
Hybrizon. *Fallen.*

Thorax brevis gibbus: abdomen sub pectus incurvatile: aculeus breviter exertus, compressus: valvula ventralis carinata anum superans.

Caput postice contractum: vertex late rotundatus: occiput angustum truncatum undique marginatum: mandibulæ forcipatæ, cuneatæ, parum curvatæ, apice emarginatæ *s.* acute bidentes: labrum subtrigonum apice appendiculatum: palpi varii maxillares ad summum 4-articulati: caput et abdomen thoraci annexa solito inferiùs: thorax brevis antice gibbus: alæ superiores areola disci antica vel subcontigua, vel sæpius incompleta: inferiores nervis longitudinalibus binis tantum, areolam brachialem sæpius

apice indiscretam includentibus: abdomen sub pectus incurvatile; segmenta anteriora inter se et cum metathorace liberrimè articulata, secundum insuper in medio flexile: sextum ventrale compressum ultra septimum dorsale productum, aculeum inferne fulciens: aculeus breviter exertus, valvulis latis compressis formæ variæ.

Larva in aphidibus solitaria interiora corporis consumens: *metamorphosin* subit intra cutem induratam *Aphidis* folliculo nullo confecto: *imago* intra paucos dies evolat per anum ejus dehiscentem: abdomen sub pectus incurvatum ejaculans aculeo resupinato aphidem eminus pungit.

Species pleræque perparvæ: *Aphides* speciei propriæ sectantur singulæ, perpaucis exceptis quæ liberius vagantur: *marum* colores utplurimum obscuriores unde *feminarum* discrimen facilius.—Ob multitudinem specierum et habitum discrepantem genus in sectiones plures *s.* subgenera dispertiendum videtur.

Tabula Synoptica Sub-generum.

- *Areola disci antica*
  - completa: *cubitales*
    - unica in apicem alæ effusa . . PRAON.
    - tres: *abdomen*
      - lanceolatum . . EPHEDRUS.
      - orbiculatum . . TRIONYX.
  - incompleta: *abdomen*
    - orbiculatum . . . . . MONOCTONUS.
    - lanceolatum: *Valvula ventralis*
      - bicornis . . . TRIOXYS.
      - inermis . . . APHIDIUS.

Subgen. I.—PRAON. *Haliday.*

Aphidius. *Essenbeck.* Fam. III.

Areola disci antica completa cubitalis unica in apicem alæ effusa: stigma intus attenuatum: abdomen lanceolatum subsessile: antennarum articulorum numerus varius, mari auctus: palpi maxillares 4-, *labiales* 3-*articulati.*

Caput oblato-globosum: mandibulæ profundius et acute bidentes: mesothoracis scutum sulculis 2 ordinariis ante scutellum conniventibus impressum, tomentosum: abdomen lanceolatum; segmentum 1^{mum}. breve basi utrinque angulatum: aculeus conicus horizontalis aut nonnihil ascendens: abdomen *maris* brevius linearioobovatum:—huic ut et reliquis subgeneribus quotquot areola disci antica completa guadent, postica apice latior est quam reliquis, nervi exinde ducti haud ortu contigui, stigma interne

attenuatum et productum, areola brachialis insuper alarum posticarum completa.

Subgenus optime distinctum. Abdominis et aculei forma *Ephedros* refert, *A. validum* insuper thorace pubescente et petiolo brevi, sed trophi, antennæ, alæque satis dirimunt. *Trionyx* antennis et trophis propior est, plura vero discrepant. Reliqua subgenera longius recedunt.

Sp. 1. A. P. dorsalis. *Hypostomate, antennis basi, pectore, pedibusque flavo-ferrugineis.* (Long. .14— ; alar. .29—).

Femina.—Caput nigro-fuscum nitidum, hypostomate et ore flavo-ferrugineis : palpi prælongi pallidiores : antennæ 20- 21-articulatæ basi latè flavescentes : thorax nigro-fuscus nitidus subtus flavo-ferrugineus : pedes longi graciles : alæ longissimæ amplæ hyalinæ sub radio infumatæ, stigmate piceo-pallido (in vivis flavescente), nervis fuscis radice et squamulis piceis : abdomen fusco-ferrugineum, segmento primo nigro-fusco postice coarctato : aculeus niger. Rarior : adsunt tres *feminæ* tantum.—(*In Museo Societatis Entomologicæ.*)

Sp. † 2. A. P. exoletus. *Hypostomate antennis basi pectore pedibus et abdomine flavo-ferrugineis.* (Long. ♀, .07—, ♂, .06.)

Bracon exoletus. *Berl. Mag.* V. 30, Sp. 47.
Aphidius exoletus. *Ess. Act. Acad.*

Præcedenti simillimus videtur. Descriptionem fusiorem petas Actorum Berolinensium loco infra laudato.

Sp. 3. A. P. volucris. *Pedibus ferrugineis, antennis* feminæ *circiter 20-articulatis.* (Long. .12 —; alar. .24, aut minor.)

Fem.—Caput et thorax nigra, os lutescens : antennæ 18- 21-articulatæ nigræ vel basi ferrugineæ : palpi paulo breviores : pedes ferruginei aut flavo-ferruginei : coxæ posticæ, nonnunquam etiam femora basi infuscata : alæ obscure hyalinæ stigmate piceo pallido, in vivis lutescente, nervis fuscis : abdomen fuscum basi dilutiùs aut fulvescens : segmentum primum fuscum brevius quam in *A. dorsali* et minus coarctatum : aculeus niger.—*Mas.* antennæ totæ nigræ 21- 23-articulatæ : pedes obscuriores, femora postica infuscata.

Hab. in memoribus satis frequens, præsertim in salicetis.—(*Mus. Soc. Ent.*)

Sp. 4. A. P. flavinodis. *Ore, antennis basi, pectore, pedibus et abdominis basi flavo-ferrugineis.* (Long. .11; alar. .24.)

Fem.—Caput nigrum, os et palpi flavescentes: antennæ 18- 19-articulatæ basi late flavescentes: thorax niger, subtus flavo-ferrugineus: alæ hyalinæ stigmate flavescente, nervis fuscis: pedes flavo-ferruginei: abdomen fuscum, segmento 1mo. toto, 2do. basi flavo-ferrugineis.

Habitat cum præcedente rarius.

Obs.—Hujus et præcedentis alæ minores, pedes breviores quam in specie prima.

Sp. 5. A. P. abjectus. *Pedibus fusco-ferrugineis, antennis* feminæ *circiter* 14-*articulatis.* (Long. .08 —; alar. .16 —.)

Fem.—Caput et thorax nigra: antennæ capite cum thorace paulo longiores, 14-, rarius 13-articulatæ, articulo 3^{tio}. basi pallescente: pedes fulvo-ferruginei, posteriorum femora basi, tibiæ medio, tarsi apice, fuscescentes: alæ obscurè hyalinæ stigmate piceo-pallido, nervis fuscis: abdomen piceum, basi media dilutius segmento primo nigricante. Statura multo brevior quam præcedentium.

Hab. inter Aphides *Angelicæ sylvestris* autumno passim; etiam in *Salice* obvius.—(*Mus. Soc. Ent.*)

Subgen. II.—Ephedrus. *Haliday.*

Aphidius. *Ess.* Fam. I.

Areola antica disci completa; cubitales tres: abdomen lanceolatum subsessile aut subpetiolatum: stigma intus attenuatum: antennæ utriusque sexus 11-*articulatæ: palpi maxillares* 4-, *labiales* 2-*articulati.*

Caput oblato-globosum: antennæ *feminæ* articulo tertio longiore, sequentibus decrescentibus; *maris* articulis subequalibus vel tertio parum elongato: mesothoracis scutum sulculis ante scutellum conniventibus, pubescens aut glabrum: alæ anticæ areola cubitali intermedia oblonga prope basin nervum recurrentem excipiente: abdomen *feminæ* lanceolatum apice compressum, *maris* brevius lineari-obovatum: aculeus conicus parum ascendens.

Sp. 6. A. E. validus. *Abdominis segmento primo brevi subrectangulo, stigmate angusto intus parum elongato.* (Long. .1 +; alar. .2 +.)

Fem.—Caput et thorax nigro-picea, punctulata, pubescentia: antennæ breviores quam in *A. lacertoso* articulo 3^tio^. luteo: alæ fumato-hyalinæ stigmate dilute piceo, nervis fuscis: stigma angustius quam in *A. plagiatore* sed latius et minus elongatum quam in *A. lacertoso:* pedes ferruginei: abdomen oblongo-lanceolatum piceum, plaga media baseos pallescente: segmentum primum granulatum opacum fuscum, brevius et crassius quam reliquis, subrectangulum basi gibbum: aculeus crassior fere vomeriformis apice ascendens niger. *Mas*, simillimus. Antennæ totæ nigræ. Statura tota multo brevior quam sequentium.

Hab.———rarissimè.—(*Mus. Soc. Ent.*)

Sp. 7. A. E. plagiator. *Abdominis segmento primo lineari, stigmate latiore intus parum elongato.* (Long. .1 ±; alar. .2 ±.)

Fem.—Nigra nitida: antennæ breves compressæ: alæ obscure hyalinæ nervis fuscis stigmate piceo: pedes antici rufo-picei, intermedii infuscati, postici obscuriores trochanteribus et tibiis basi aut latius rufescentibus: abdomen lineari-lanceolatum, piceum, plaga media baseos pallida, petiolus linearis in medio fere obsolete tuberculatus: aculeus gracilis, conicus, niger. *Mas*, similis plerunque minor, pedibus obscurioribus.

Hab. in memoribus passim minus frequens.—(*Mus. Soc. Ent.*)

Bracon plagiator. *Berl. Mag.* V.

Obs.—A sequente facile distinguendus colore obscuriore, alis haud infumatis, stigmatis forma, antennis brevibus, plerunque etiam statura minore.

Sp. 8. A. E. lacertosus. *Abdominis segmento primo lineari, stigmate angusto, intus valde elongato.* (Long. .14—; alar. .26—.)

Fem.—Nigra nitida: antennæ concolores pedicello ferrugineo, articulo tertio longissimo: alæ quam in præcedentibus longiores, fumato-hyalinæ nervis fuscis, stigmate piceo (in vivis lutescente): pedes ferruginei, femora postica fusca: abdomen lineari-lanceolatum plaga media baseos pallescente, petiolus ut in præcedente: aculeus gracilior niger: stigma huic angustius et internè attenuato-elongatum unde areola cubitalis prima solito longior. *Mas*, antennis nigris.

Habitat, in agris passim *Aphides Ervi* forsitan et alias pungens[g]. (*Mus. Soc. Ent.*)

[g] In oviposition it carries the abdomen like the genuine *Aphidii*, but pierces the *back* of the *Puceron*, for which the slight inclination of the borer seems adapted, and the contact is less instantaneous, being often prolonged for several seconds.

Variat. femina, minor : antennæ basi ferrugineæ, scapo fusco : pedes toti ferruginei : abdomen obscurè ferrugineum lateribus infuscatum : aculeus concolor.

Hab. in salicetis et alibi haud infrequens.

Subgen. III.—Trionyx. *Haliday.*

Areola antica disci completa, cubitales tres : stigma intus attenuatum : abdomen orbiculatum, petiolatum : antennarum articulorum numerus varius mari *auctus : palpi maxillares* 4-, *labiales 3-articulati.*

Caput transversum rotundatum : palpi longiusculi : mandibulæ profundius et acute bidentes : mesothoracis scutum sulculis ordinariis ante scutellum conniventibus impressum, glabrum : alæ ut in *Ephedro :* abdomen orbiculatum planum, petiolo gracili lineari ante medium utrinque denticulato, segm^{to}. 2do. maximo lævi, reliquis brevissimis linearibus : aculeus decurvus infernè valde dilatatus, deltoideus, apice tricuspis.

Alæ hujus subgeneris et præcedentis omnino similes, sed statura tota antennæ, petiolus, et abdomen (aliquatenus etiam aculei forma) *Monoctonum* referunt. Trophi ab utroque discrepantes cum *Praone* melius congruunt.

Sp. 9. A. T. deltiger. (Long. .1 ; alar. .2.)

Femina.—Caput et thorax nigra, nitida, os et palpi lutescentes : antennæ 19—21-articulatæ fuscæ articulis 4 aut 5 baseos flavo-ferrugineis : alæ hyalinæ nervis fuscis, stigmate luteo-piceo : forma stigmatis fere qualis *A. valido :* pedes, abdomen et aculeus flavo-ferruginea : abdomen lateribus vel etiam dorso postice infuscatum. — *Mas*, antennæ 21-articulatæ fuscæ, articulo tertio flavescente : os piceum palpis lutescentibus : abdomen paulo angustius, fuscum basi dilutius, petiolus saturatiùs ferrugineus.

Hab. in agris rarius.—*Mas* semel captus *femina* pluries.—(*Mus. Soc. Ent.*)

Subgen. IV.—Monoctonus. *Haliday.*

Areola disci antica et cubitales interior confluentes : stigma intus attenuato-elongatum : abdomen orbiculatum petiolatum : antennarum articulorum numerus varius mari *auctus : palpi maxillares* 4-, *labiales 2-articulati.*

Caput transversum rotundatum : palpi labiales brevissimi : mesothoracis scutum glabrum læve, vel antice sulculis abbreviatis

obsoletis impressum: alæ apice longitudinaliter rugulosæ, stigmate angustissimo introrsum valde elongato: cubitus a stigmate fere recta descendens, angulatus et mox abruptus: areola magna irregularis brevior est quam subgeneri ultimo, fere sub stigmate clausa: abdominis et petioli forma quales Subgeneri præcedenti: aculeus decurvus, cuspidatus, basi inferne angulato-dilatatus.

De relatione hujus cum proxime præcedente pauca præmissa sunt:—*mares* nonnulli minores areola indistincta a maribus Subgenerum sequentium similiter deficientibus, formâ stigmatis perspectâ discerni poterunt. *A. Crepidis*, (Sp. 21.) autem petioli formâ propior, quoad cætera longè discrepat.

Sp. 10. A. M. nervosus. *Antennis* feminæ 16-*articulatis*, *areola distinctissima.* (Long. .9; alar. .18—.)

Fem.—Nigra; antennæ basi flavescentes scapo fusco: alæ obscuræ stigmate pallide-piceo, nervis validis fuscis: pedes ferruginei, femora postica infuscata: petiolus fuscus: abdomen antice dilute piceum, postice fuscum: aculeus piceus.

Hab. Rarius: *feminæ* binæ tantum adsunt.

Sp. 11. A. M. Caricis. *Antennis* feminæ 13-*articulatis*, *areola subtilissimè delineatâ.* (Long. .07; alar. .13±.)

Femina.—Nigro-fusca: antennæ plerunque basi lutescentes scapo fusco: alæ obscure hyalinæ stigmate pallido, nervus areolam externe ambiens tenuissimus vix conspicuus: pedes lutei aut ferruginei: abdomen dilute piceum *s.* fusco-ferrugineum apice fuscum: petiolus brevior quam præcedente: aculeus piceus aut lutescens.—*Mas* niger: antennæ longitudine corporis 16-articulatæ nigræ: geniculi pedum picei aut ferruginei: abdomen angustius quam *feminæ*, dilute piceum apice nonnunquam petiolo fuscis: variat colore dilutiore.

Hab. in *Festuca fluitante*, *Carice*, &c. paludum; in gramine locis humidis.—(*Mus. Soc. Ent.*)

Subgen. V.—Trioxys. *Haliday.*

Areola disci antica et cubitales unâ effusæ: stigma trigonum: abdomen lanceolatum petiolatum: valvula ventralis bicornis: antennæ feminæ 11-, *rarius* 10- *aut* 12-*articulatæ*, maris 13-*articulatæ: palpi maxillares* 4-, *labiales* 2-*articulati.*

Caput transversum rotundatum crassius quam præcedentibus: antennæ *feminæ* breves nonnunquam apice crassiores: mesotho-

racis scutum lævissimum glabrum: areolæ in medio alæ ne vestigium quidem adest: cubitus haud angulatus sed arcuatus, ante apicem alæ abruptus, longior tamen quam *Aphidiis* genuinis: petiolus linearis tuberculis vario situ prominulis: aculeus fere ut in *Monoctono*, decurvus inter cornua bina acuta ipso longiora e valvula ventrali (segmento 6to.) orta et apice nonnihil sursum curvata.

Mares nonnulli minores e subgenere ultimo areola indistincta similiores, cubito breviore, antennarum articulis pluribus, plerunque etiam stigmate angustiore differunt.—*Feminarum* vero discrimen statim patet ob apparatum insolitum aculei.

Sp. 12. A. T. auctus. *Antennis* feminæ 12-*articulatis petiolo ante medium tuberculato.* (Long. .07; alar. .13.)

Fem.—Caput et thorax nigra nitida, os fulvescens; antennæ basi fulvescentes: alæ obscure hyalinæ stigmate (in vivis luteo) nervisque dilute piceis: stigma angustius quam reliquis: pedes fulvo-ferruginei, posteriorum coxis, femoribus tibiisque medio tarsis apice fuscis: abdomen piceum basi, media dilutius aut fulvescens: petiolus fulvo-ferrugineus crassiusculus ante medium utrinque denticulatus. — *Mas*, antennæ graciliores et longiores quam in *A. Heraclei* ♂, nigræ: femora antica supra, tibiæ medio infuscatæ: pedes posteriores obscuriores quam *feminæ*.

Hab. in *Salicibus* haud infrequens.—(*Mus. Soc. Ent.*)

Sp. 13. A. T. pallidus. *Pallide flavus: capite thoraceque nigris, antennarum articulis septem exterioribus fuscis:* (*antennis* feminæ 11-*articulatis gracilibus, petiolo ante medium tuberculato.*) (Long. .08; alar. .15.)

Fem.—Os flavum; antennæ filiformes graciles et ratione corporis longiores quam in reliquis: alæ hyalinæ stigmate flavo-pallido, nervis dilute fuscis, radice et squamulis piceo-stramineis: pedes vel toti pallide flavi vel posticorum femoribus tibiisque medio fuscescentibus: abdomen gracile segmentis intermediis, vel etiam posticis infuscatis.

Hab. in *Carice* paludum rarius; etiam in *Coryli* foliis semel captus.

Sp. 14. A. T. Angelicæ. *Antennis basi pedibus anticis et geniculis fulvo-ferrugineis:* (*antennis* feminæ 11-*articulatis filiformibus, petiolo bituberculato.*) (Long. .08; alar. 15.)

Fem.—Caput et thorax nigra: os et palpi lutescentes: antennæ breviores quam in sequente, apice haud incrassatæ: alæ (ut in

sequentibus etiam) hyalinæ nervis fuscis, stigmate dilute piceo (in vivis lutescente), radice et squamulis piceis: pedes fulvo-ferruginei, posteriorum femora supra, tibiæ medio, tarsi apice infuscati: coxæ posticæ fuscæ: abdomen lineari-lanceolatum fuscum aculeo concolore, basi media et petiolo dilutius: valvula ventralis et cornua lutescunt: petiolus gracilis utrinque bidentatus medio infuscatus.

Hab. inter Aphidis *Angelicæ sylvestris* autumno parum frequens.—(*Mus. Soc. Ent.*)

Sp. 15. A. T. Centaureæ. *Pedibus anticis et geniculis lutescentibus:* (*antennis* feminæ 11-*articulatis filiformibus, petiolo pone medium tuberculato.*) (Long. 11.; alar. .19.)

Fem.—Caput et thorax nigra: antennæ graciles nigræ, breviore, quam in *A. aucto:* palpi picei: pedes antici lutescenti-ferruginei, postici picei trochanteribus et basi tibiarum ferrugineis: abdomen lineari-lanceolatum nigro-piceum, segmenti secundi medio pallescente: petiolus gracilis inter medium et apicem denticulatus.

Hab. in Aphidibus *Centaureæ nigræ* minus frequens.[h]

Sp. 16. A. T. Aceris. *Pedibus anticis et geniculis abdominisque basi et apice luteis:* (*antennis* feminæ 11-*articulatis longiusculis apice crassioribus, petiolo ante medium tuberculato.*) (Long. .12; alar. .21.)

Aphidius Cirsii. *Curt. B. E.* 383.

Fem.—Caput nigrum, os lutescens: antennæ multo longiores quam in sequentibus, sensim incrassatæ articulo ultimo magno oblongo: thorax niger: pedes lutei, posteriorum femora, tibiæ medio, tarsi apice, fuscescentes aut picei: coxæ posticæ fuscæ: abdomen dorso fuscum postice lutescens fere croceum: petiolus sordide luteus, ante medium denticulatus.

Prodiit mihi ex Aphidibus *Aceris Pseudoplatani* Julio mense.

Sp. 17. A. T. Heraclei. *Hypostomate antennis basi, pedibus anticis et geniculis, abdominisque basi et apice luteis:* (*antennis* feminæ 11-*articulatis brevibus apice crassioribus, petiolo bituberculato.*) (Long. .09; alar. .17.)

Fem.—Caput nigrum, facie tota sub antennis et ore luteis: antennæ

[h] I have observed this species attacking the pucerons of the Centaury; its proceedings are similar to those of the true *Aphidii* (see the note under *A. Rosæ*, Sp. 27): it pierces the under side of the puceron, and by an equally instantaneous touch; nor could I perceive that the singular anal horns serve any purpose in this operation.

sensim incrassatæ articulo ultimo magno, basi clarè lutescentes : thorax niger collo luteo rarius piceo : pedes lutei, posteriorum femoribus et tibiis basi denita tarsisque apice fuscis : coxæ posticæ fuscæ : abdomen luteum medio fuscescens : petiolus utrinque circa medium denticulis 2 minutis, sive crenulatus : cornua analia apice sursum curvata insigniùs quam in præcedentibus.—*Mas*, fere totus niger antennis concoloribus : pedes antici posteriorum trochanteres tibiæ tarsique basi sordide lutei : abdomen nigropiceum basi sordide lutescens.

Habitat in Aphidibus *Heraclei Sphondylii* florentis Julio mense vulgatissimus, posthâc vix obvius.—(*Mus. Soc. Ent.*)

Sp. 18. A. T. letifer. *Capite thoraceque nigris pedibus anticis geniculis et abdominis basi apiceque lutescentibus : (antennis et petiolo fere ut in præcedente.)* (Long. .08; alar. .15.)

Fem.—Præcedenti similis : caput totum nigrum : antennæ paulo breviores nigræ prope basin pallescentes scapo ipso fusco : thorax niger : pedes obscuriores, tarsi breviores : abdomen antice sordidius lutescens petioli medio infuscato.

Prodiit mihi ex Aphidibus *Salicis ulmi-foliæ*, Junio mense.

Sp. 19. A. T. minutus. *Capite thoraceque nigris, pedum geniculis fulvescentibus : (antennis* feminæ 11-*articulatis brevissimis.)* (Long. .07; alar. .13.)

Fem.—A. brevicorni simillimus sed antennæ 11-articulatæ, articulis tamen duobus apicis arcte conjunctis, ultimo haud elongato. Pedes picei geniculis ferrugineis aut fulvis: tarsi breviores : abdomen piceum ano obscurè lutescente.

Captus in *Buxo Balearica* Aphidibus scatente Junio mense.

Sp. 20. A. T. brevicornis. *Antennis* feminæ 10-*articulatis.* (Long. .06; alar. .1 +.)

Fem.—Nigra : antennæ perbreves apice crassiores articulo ultimo magno oblongo, tertio basi pallescente : pedes picei ; geniculis, anticorum etiam femoribus tibiisque subtus ferrugineis : abdomen pallide piceum lateribus infuscatum, ano obscure lutescente : petiolus fere in medio obsolete denticulatus, nonnunquam bituberculatus.

Hab. in umbelliferis, *Angelica sylvestri* præcipuè, parum frequens. —(*Mus. Soc. Ent.*)

(To be continued.)

Art. LX.—*Colloquia Entomologica.*

(This contribution is not by the author of the former series.)

Scene—*An open space in a Beech-wood, Gloucestershire.*
Entomologus *and* Tyro *seated on the ground.*

Tyro. See, *Macroglossa stellatarum!*—I knocked him down with my hat as he was banqueting on the sweets of a honey-suckle——

Ent. —thrusting his long tongue into the flowers; and, if alarmed, darting off like an arrow.

Tyro. Yes; directly he caught sight of me, he whisked away: and I should have taken him for one of those moths that wear their good-looking name in the shape of a *Greek letter* embroidered on their cloak, which we so often see flying about flowers in the sunshine.

Ent. *Plusia gamma.*

Tyro. Probably. But my quarry quickly returned to his feast; and, as I took care to stand perfectly still, he seemed to be better reconciled to me, and I had time to take more notice of him, as he quaffed cup after cup of the delicious nectar;—I soon saw what he was, and quickly pounced on him.

Ent. They are by no means common. I have a large plant of *Centranthus latifolius*, which they regularly frequent every year: two or three sometimes humming (for the motion of their wings makes a melodious, though not loud hum—as I dare say you observed) about it; at once inserting their elongate *maxillæ* into its little upright tubular corollas; and, as they fly with their body nearly parallel to the ground, they are obliged to bend them to get to the bottom of the flowers;—and I notice, they do not describe a curve, as one would suppose would be the case with so flexile an instrument, but are bent quite at an angle.

Tyro. I think I noticed something of the sort just now in some butterflies which were flitting about a bed of thistles on the edge of the wood. I watched them, as they alighted on a head, turn completely round; and, after examining it on all

sides, as if in search of a tit-bit, began their meal; and I observed, when they wished to taste the sweets of a floret near their mouth, they did not alter their position, but, bending their trunk in the shape of a syphon, plunged it into its nectary.

Ent. Look at those butterflies, full of enjoyment, basking in the bright sunshine, now spreading out their wings—*maculis insignis et auro*—or, if the shadow of a cloud passes over, suddenly closing them, and in an instant shooting up a dark line against the sky, which, standing out from amidst the florets, reminds one of a furled banner towering above the bristling lances of some warlike host;——

Tyro. —or, "*parva componere magnis*,"—like the spiry aloe, piercing out from the lion-haunted brushwood of South Africa; which, seen by some pious missionary, as he addresses himself to repose after a weary day's journey, pointing upwards to the calm moon-lit sky, raises his thoughts to Heaven, and he forgets the fatigues and dangers of his toilsome way, in the contemplation of peaceful realms of everlasting rest, to gain which for himself and his fellow men, he has exchanged a happy home for the dangers that now surround him.—I want to know, and I don't doubt you can tell me, the name of a bee which sadly disfigures *Stachys lanigera* in my garden; it seems as great an enemy to this plant as the leaf-cutter bee is to the rose, making holes in its leaves; and this it does not effect like that insect, by cutting pieces out, but by despoiling them of their down, often in little patches;—the portions of the leaf thus deprived of their natural covering, dry up, and soon decay, from exposure to the influence of the sun and rain.

Ent. Your little depredator is the female of *Anthidium manicatum*.

Tyro. I was a good deal amused with them; they are remarkably industrious little creatures: one I watched was so intent on her work as to let me get near enough to hear her pluck up the down, which she did with a noise like that of a horse grazing. Every successive mouthful was thrust under her body, where it seemed to be formed into a little ball; when she had collected enough, she flew off with it, bending in her head and tail to keep her load in its place—but I never could track her home.

Ent. I believe she uses it to cover the outside of her cells:

but I have a *nidus* under observation, and I hope soon to be able to satisfy your inquiries about them.

Tyro. I shall expect to learn all about them;—*you* seem to have such good opportunities for observation. I can't help fancying to myself how pleasantly you wile away many an otherwise care-full hour in your delightful garden, amidst "*omnia copia narium*," watching your favourites, who, like little familiars, reveal to you, as if by the force of some secret spell, what they conceal from more superficial, or less talented observers.

Ent. Such pursuits possess, above most others, the power of tranquillizing the agitations of a troubled spirit,—of inducing those feelings, that mood of mind, in which, if past sorrows are not all forgotten, their remembrance recurs to the mind deprived of its poignancy. Often have I perceived them to be

> "Deformis agrimoniæ
> Dulcibus alloquiis,"—

and it is pleasant to think that the happiness afforded by these pursuits is accessible to all, or most of us, how or wherever situated. As a French naturalist has well observed,—he is addressing those engaged in the study of natural history:—"Dans les vastes plaines et au milieu des bois touffus, sur le haut des monts et dans le fond de la vallée solitaire, vers le bord des ruisseaux paisibles et sur l'immense surface de l'océan, vous serez sans cesse entourés des objets de votre étude."

Tyro. Very true; yet how many are so regardless—take so little note of what passes around them, that they would go to their graves without discovering half the beauties of nature, if no one unfolded its leaves for them;—thus losing some of the purest pleasures the embodied soul is capable of enjoying, for want of an interpreter. Such interpreters, while they open to many a new and inexhaustible source of pleasure, are of great utility; and we must love and venerate the man who employs his talents in thus increasing the amount of human happiness. With what a host of delightful associations such names as Ray, Kirby, and White, are connected!

Ent. I will confess to you, I have no higher ambition than thus

"To build myself, in gentle hearts,
A shrine of lasting memory."

But I think, after all, it is to the study of Entomology, as a science, that your observations will most forcibly apply.

TYRO. Well, I hardly know; though I have sometimes thought, as I have been resting in the shade of some lofty—

ENT.—

"Qua pinus ingens, albaque populus
Umbram hospitalem consociare amant
Raucis; et obliquo laborat
Lympha fugax trepidare rivo."

TYRO. Leave out the poplar and it will do very well, even to the *Lympha fugax;* for, where I lay, the sleep-inviting murmur of a viewless stream falls gently on the ear. I was just thinking of a favourite spot.

ENT. Where?

TYRO. Oh, just by us. *My* pine stands on a little knoll, overlooking a beautiful piece of water that, almost surrounded by woods, seems to repose on the green lap of the forest: on one side is a hill which, after many an undulating swell, slopes gradually off to the water's edge; and so deep is its repose, one feels some difficulty in persuading oneself that the wood ends with the bank, as it is reflected on the bosom of the quiet lake.

ENT. You forget the trees must be upside down—a position which would be very unpicturesque.

TYRO. Oh! you don't know the place, so you can hardly judge. I must tell you, my position is some considerable height above the water, and looks down abruptly on it, for the hill just here on this side suddenly becomes precipitous; the bank rises, rampart-like, from the water, and, on the opposite side, the margin is fringed with low-growing trees and shrubs, so that no deflected stems appear in the lake, to *prove* it an illusion, which is, indeed, so perfect as would need immersion to dispel, if it were not for that pair of swans which, more like apparitions than material beings, noiseless as a mist-wreath floating across the midnight sky, move, queen-like, along, and scarcely disturb the sleeping surface of that dark silent flood; the ripple in their wake dying ere it reach those *Nymphæ luteæ*, which, with their broad island-like leaves, the resort of water-beetles, and golden flowers rising up amongst them, like the

crescent-tipped minarets of an eastern city, come too to the aid of the senses, and act as counsel for reason against imagination. Then the humming in the air—

> "That undefined and mingled hum,
> Voice of the forest never dumb,"

which you entomologists, I think, are not yet agreed as to the cause of. No sign of animal life, but the gambols of various kinds of insects disporting around me; and, as I have amused myself with observing them, and have watched brilliant flies hovering over the flowers, and hardly ever alighting, seeming to live on their most delicate breath, the very acme of insect happiness,—and the tiny beetle climb slowly up to the top of a bent, suddenly take flight on some instinct-directed errand,—and listened to the wilding-bee humming his evening orisons as he darted into the cup of the hare-bell, where he is soon lost in forgetfulness, perhaps, even before his nature-provided hammock has recovered the equilibrium his entrance disturbed,—and as hundreds of silver-bedropped moths—but it is idle to re-detail these things to you—you who are so well acquainted with Nature's "shews and forms," and have so often roamed through field and forest engaged in pursuit of these interesting creatures.

ENT. Let us then admire them as the creation of a Divine Architect—let us enter the vestibule of that temple, to the unveiled glories of whose interior, the science which makes us more perfectly acquainted with this wonderfully-beautiful portion of Nature's works, would introduce us.

TYRO. It is there we are permitted to trace—

> "The unambiguous footsteps of the God
> Who gives its lustre to an insect's wing,
> And wheels his throne upon the rolling worlds."

(*Exeunt.*)

ART. LXI.—*Notice of Entomological Works.*

1. *Die Arachniden. Getren nach der Natur abgebildet und beschrieben von D. Carl Wilh. Haln. Erster Band. Viertes Heft. Mit sechs fein ausgemalten Tafeln. Nurnburg.* 1833.—In this number are figured one species of

Mygale, two of *Lycosa*, and thirteen of *Theridion*, of which eight are now described for the first time.

2. *Iconographie, &c. des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome troisieme. 5me. Livraison.* — The group *Feronia* is completed in this number; it also contains figures of the genera *Camptoscelis*, *Myas*, and *Cephalotes*.

3. *Magasin de Zoologie; par M. Guerin.*—It would be waste of time and space to enumerate all the *Annulosa* lately figured in this interesting work; we shall, therefore, only point out some of the most remarkable. In plate 41 (part *Insecta*) there is the figure of a *larva*, stated to be that of *Anthia sex-guttata;* it is so decidedly different from that of any Adephagous insect we have hitherto seen, that we find our credulity somewhat taxed in believing it. Our correspondent, Mr. Newman, has given a very correct outline of this remarkable *larva*, Plate III., Fig. 6, to which we invite our readers' attention. *Metopias curculionides*, a new genus of *Pselaphidæ*, found in Cayenne, remarkable for the anterior part of the head being produced into a horn, at the end of which are placed the antennæ. *Calodromus Mellyi* (Pl. 34), a new genus of *Coleoptera*, allied to the *Brentidæ*, and found on the coast of Coromandel: this is a truly remarkable insect; the basal joint of the *metatarsi*[a] is three times the length of the rest of the leg. *Cephaleus infumatus*, a new Hemipterous genus. There is a clever monograph on the Crustaceous genus, *Mithrox*, by Milne Edwards. De Laporte's excellent Essay on the *Hemiptera* is concluded.

4. *Annales de la Société Entomologique de France: Tome I., Trimestre* 4, *et Tome II. Trimestre* 1 *et 2.*—These, like the preceding number, contain many interesting and clever essays; the principal are, "Notice on the Entomology of French Guiana, by M. Lacordaine;" "Observations on Dahlborn's Monograph of the Scandinavian Bombi, by M. Pelletier St. Fargeau;" "Memoir on fifty Species of Insects, either new or little known, by M. de Laporte;" "Continua-

[a] *Tarsi of the posterior legs;* we adopt the word from Mr. Newman. *Vide ante*, p. 415.

tion of a Catalogue of Corsican Lepidoptera, by M. Rambur;" "On the Structure of the Nest of *Mygale fodiens*, by M. Audouin;" a figure of the nest is given, shewing the singular door by which its entrance is closed. "Division of the genus *Satyrus* into nine groups, by characters taken from the nervures of the wings and from the antennæ, by M. Duponchel;" "Essay on the genus *Lampyris*, by M. de Laporte;" Lampyris is here divided into nineteen genera, fourteen of which are new; we admire the elegance of M. de Laporte's names, and wish that our English entomologists could avoid those clumsy and barbarous compounds with which they often disgrace their compositions. "On the Metamorphosis of *Ceratopogon*, with the descriptions of two new species, by M. F. E. Guerin;" "A century of new *Carabidæ*, by M. Gory;" "Essay on the *Buprestidæ*, by M. Solier;" characters of thirty-four genera are given, with accurately executed dissections of all but three of them. "M. Fisher on some genera of Orthoptera." We look on these "Annales" with kindly affection, and recommend them to all scientific entomologists.

5. *Catalogue des Coléoptères de la Collection de M. Le Comte Dejean, Livraison* 1e. *et* 2de.—This catalogue, with synonyms and habitats, is essential to the general collector. The author pays too little attention to the names of genera established in this country; we cannot help thinking, that courtesy should suggest their adoption, where they enjoy the right of priority. However, let us endeavour to make ourselves of that importance which shall demand notice; we have hitherto been too much engaged in making beautiful drawings, in inventing hard names, in theorizing, in criticizing, in petty bickering; all the time thus spent is lost to science, and our neighbours have gone by us while we have been busied on mere nothings; they have embraced the substance, we the shadow; let us cease to be superficial, and we shall not have to complain of want of fair dealing.

6. *Observationes nonnullæ in Coleoptera Indiæ Orientalis, &c. &c. Maximilianus Perty.* 1831. — Ours reader will conclude, and with justice, that it must be something unusually flowery that can tempt us to notice a book two years old.

How we came to have omitted it until now we cannot imagine, but we hasten to repair the injury the learned author has suffered at our hands. The work begins with twelve theses, which we give at length, because we admire such of them as we can understand, and because we are astonished at the depth of those we don't understand, *risum teneatis*, that is no mistake, though, perhaps, a little egotistical; we mean, we are astonished to find *anything* which we can't understand. What connexion exists between these theses and the beetles of the East Indies, we cannot at present make out.

THESES.

I.

Per antithesin factus est mundus, et per antagonismum conservatur.

II.

In corporum cœlestium genesi theoria aggregationis momenti majoris est quam Vulcanismus et Neptunismus.

III.

Maris decrescentia non tam ab evaporatione, aut consumtione per naturam organicam, quam ex penetratione versus orbis terrarum centrum deducenda.

IV.

Ignis in terrarum orbe centralis sanè est admittendus.

V.

Quod sunt vires mechanicæ in natura organica, id sunt vires organicæ in regno animali et vegetabili; quod sunt vires organicæ in natura organica, id sunt vires psychicæ in gente humana; per omnem naturam perpetua analogia, vires eædem non qualitate sed evolutione tantum diversæ.

VI.

Expone mihi graminis humillimi indolem, tunc ego phantasiam et mentis humanæ agitationem tibi explicabo.

VII.

Conditio animalium psychica certò et exclusivè ex eorum organizatione derivari potest.

VIII.

Oxygenum et photogenium sunt potentiæ vivificæ universales.

IX.

Limites exacti inter initia regni utriusque organici non inveniendi sunt.

X.

In generatione plantarum et animalium simplicissimorum a causis elementaribus destinatur, utrum particula aliqua materiæ organizandæ planta, an animal futura sit.

XI.

A massæ nervosæ copia proportionali et processus respiratorii gradu in genere animalium magnitudo dependet: ideo Insecta et Aranidæ molis tam exiguæ sunt.

XII.

Organisatio infusoriorum perfectior, a celeberrimo Ehrenberg nuperrime detecta generationi eorum spontaneæ non contradicit.

And then the gauntlet is thrown down to all who choose to enter the lists in the way of disputation; for our part, we would admit the central penetration of sea, or spontaneous generation, or any thing, rather than accept the challenge.

Hasce theses defendere paratus sum si forte T. T. opponentes ex iis, quam ex dissertatione materiam disputandi eligere maluerunt.

We would have translated all these theses, but found our little store of school Latin is grown mouldy for want of use, and we bartered our Ainsworth, the day before we left, for a double-bladed knife, and gave our lexicon *in;* we began the task, but the words *antagonismum, Vulcanismus, Neptunismus, psychicæ*, &c., &c., made us pause.

7. *The Entomology of Australia, in a series of Monographs; by George Robert Gray, &c. Part I., containing Phasma.*—This work, as far as the plates are concerned, is admirable, and does the artist infinite credit. The scientific character of the work would have been raised, by anatomical figures of the mouth of each genus; but we suppose these have been omitted as likely to injure the general appearance of the plates, with which we are so delighted, that we feel little inclined to say anything about the letter-press; but duty must be attended to, and we therefore inform our readers that this part of the work is no improvement: how Mr. Gray could trust himself on such a task, we cannot think! he should have taken Stoll and Audinet-Serville, and studied them for weeks, before he ventured on *Orthoptera*. He says of the *Phasmidæ*, "they belong to the first section, *Cursoria*, or walkers, and differ very much from the other family of the

same section, termed *Mantidæ*," &c. From this it follows, that there are but two sections of the *Cursoria*; so that *Blatta* must be invested with the powers of leaping, and placed among the *Saltatoria*, or—an equal violation of nature—joined hand in hand with *Phasma*, whilst this last is separated from its near neighbours, *Mantis*, *Empusa*, and *Phyllium*. *Forficula* and *Thrips* are also Orthopterous; the former has long since been included among the *Cursoria*, which, by the way, we would, with Mr. Gray's permission, Gallicise "*Coureurs*," and Anglicise "*Runners*." Audinet-Serville was wrong, as we conceive, in separating *Mantis* and *Spectrum*, not but what these constitute distinct families, but because they naturally fall into two others equally so, and the stirps *Phasmina*, MacLeay, thus divides into five distinct families, the first, however, being excluded by that author:—

1. Mantispidæ. Alis 4 æqualibus.
2. Empusidæ . . Capite in cornu producto.
3. Mantidæ . . Capite simplice.
4. Phasmidæ . . Corpore lineari, plerumque aptero.
5. Phylliidæ . Corpore dilatato, alato.

The detailed characters of these families should have been supplied, and then those particular families to be described should have been subdivided into genera, and these genera again into species. As it is, we are left entirely to our option as to what genus we choose to refer each species: the descriptions, we observe, are in the neuter; thus agreeing with *Phasma*, yet we can find no characters of such a genus. The whole of the letter-press, moreover, is turned out of hand in a careless unscientific manner, which we really regret, seeing the beauty and accuracy of the plates. We observe the name of one of our most eminent entomologists[b] is given throughout incorrectly;—colours are described in a way no entomologist can understand, and violations of orthography and grammar might be pointed out. We intreat Mr. Gray to exercise a little more care, if he ever expects his work to obtain the patronage of the scientific.

8. *Genera Dyticeorum auctore, Dr. Guil. Ferd. Erichson. Berlin*, 1832.—This is a little book that every body should

[b] The Rev. Frederick William Hope.

have; it is a *sine quâ non* to the entomologist; the price is almost nothing, and it is full of information. For the benefit of those who do not choose to purchase, we will transcribe the following

Synopsis Generum.

A. Coxæ posticæ amplæ.

I. Tarsi anteriores articulo quarto distincto.

a. Tarsi antici *maris* patellati.

1. Cybister. Pedibus anterioribus extus, posticis in utroque sexu utrinque ciliatis, his unguiculo, unico, porrecto, fixo.
2. Eunectes. Pedibus anterioribus intus, posticis in utroque sexu utrinque ciliatis, unguiculis duobus subæqualibus, porrectis.
3. Acilius. Pedibus anticis extus, posticis in utroque sexu utrinque ciliatis, his unguiculis duobus inæqualibus, porrectis superiore fixo: tarsis subtus articulis tribus primis ciliatis.
4. Hydaticus. Pedibus anterioribus extus, posticis in utroque sexu utrinque ciliatis, his unguiculis duobus inæqualibus, superiore fixo; tarsis subtus articulis quatuor primis ciliatis.
5. Dyticus. Pedibus anterioribus extus, posticis in *mare* utrinque, in *femina* modo supra ciliatis, his unguiculis duobus æqualibus mobilibus.

b. Tarsi antici *maris* simpliciter dilatati.

6. Colymbetes. Scutello conspicuo; pedibus posticis in *mare* utrinque, in *femina* modo supra ciliatis; unguiculis inæqualibus superiore fixo, inferiore hoc triplo breviore; palporum labialium articulo secundo tertio evidenter longiore.
7. Ilybius. Scutello conspicuo; pedibus posticis in *mare* utrinque in *femina* modo supra ciliatis, unguiculis inæqualibus superiore fixo, inferiore hoc parum breviore; palporum labialium articulo secundo tertio subæquali.
8. Agabus. Scutello conspicuo; pedibus posticis in *mare* utrinque in *femina* modo supra ciliatis: unguiculis inæqualibus mobilibus.
9. Copelatus. Scutello conspicuo; pedibus posticis in utroque sexu utrinque ciliatis; unguiculis inæqualibus mobilibus.

10. Laccophilus. Scutello inconspicuo; antennis tenuibus setaceis; pedibus posticis unguiculis inæqualibus superiore fixo, porrecto.

11. Noterus. Scutello inconspicuo; antennis crassiusculis fusiformibus; pedibus posticis unguiculis æqualibus, mobilibus.

II. Tarsi anteriores articulo quarto obsolescente.

12. Hyphydrus. Tarsis posticis compressis, unguiculis inæqualibus porrectis; superiore fixo.

13. Hydroporus. Tarsis posticis filiformibus, unguiculis inæqualibus, mobilibus.

B. Coxæ posticæ angustæ.

I. Antennæ 11-articulatæ, infra oculos insertæ.

14. Pelobius.

II. Antennæ 10-articulatæ, in fronte insertæ.

15. Haliplus. Palporum maxillarium articulo ultimo minuto, subuliformi.

16. Cnemidotus. Palporum maxillarium articulo ultimo reliquis majore conico.

A detailed character of the whole group, as to internal and external anatomy, habit, &c., and a detailed description of each genus, is given in the same clear and intelligible manner as this *synopsis*.

9. *Magazine of Natural History*.—The principal entomological papers that have appeared in this excellent magazine, since our last notice, are by the Rev. W. T. Bree, Mr. Yarrell, and Dr. Johnson. So great a proportion of our readers see this work, and we have already swelled our reviews to so unusual a length, that we must dispense with quotations or criticisms. One of our correspondents alludes to the decrease of matter and wood-cuts; this, however, we trust is merely casual, and we hope to see the original quantity again. We miss Rusticus in the late numbers; he complained to us, some time since, that Mr. Loudon had "pruned" his epistles with rather too free a hand; but we hope he has forgiven this, and enriched Mr. Loudon, as he has ourselves, by a twelve-months' store. The July number contained some laughable observations about ourselves, from the pen of Mr. Westwood: we believe we had been reviewing him, but the particulars have escaped our memory.

10. *Annales des Sciences Naturelles, par M. Adouin.*— This is a work of great value; its editor is talented as a writer and reasoner, and one of the most accomplished entomologists of the day. In the number of these Annales for January 1833, is a very long and philosophical memoir, by Professor Baer, which contains some allusions to insects. In the same number is a memoir, by Milne Edwards, on the mouths of some *Crustacea.* In Vol. XXVII., page 316, is a paper by Mr. Westwood, on *Crustacea.* In Vol. XXVI., p. 369, a memoir by M. Pictet, on *Nemoura;* and another, (Vol. XXVIII., p. 44,) by the same author, on *Perla.* M. Pictet remarks, that the *Nemouræ* part with their tails, and the *Perlæ* preserve them, when they arrive at perfection: we were aware the presence or absence of this appendage was a distinguishing characteristic of the *imagines* of these families; but certainly did not know that both possessed it in the prior stages. The author remarks on the fact of these tribes possessing an active *pupa,* as being new; we have known this from our childhood; and have often picked the skin of the *pupa* from reeds, &c. after the imago had burst from it and taken wing. M. Pictet accuses Mr. Curtis unjustly of having drawn the nervures of the wings of *Perla cephalotes* incorrectly, seemingly not aware that these nervures differ, not only in different specimens, but even in the opposite wings of the same insect.

11. *London and Edinburgh Philosophical Magazine, &c.,* Vol. II., p. 443. — Mr. Westwood has here concluded his "Descriptions of several new British Forms among the Parasitic Hymenopterous Insects." 1. *Monodontomerus;* this genus is the same as *Priomerus,* Walker; the species described by Mr. Westwood has fewer denticulations beneath the *metafemora* than the species described by Mr. Walker; however, from the figure given, Mr. Westwood's species appears to have two slight denticulations near the apex of the thigh, besides the one mentioned. Dalman's *Torymus dentipes* is a totally different genus, and we think may be the same as Mr. Walker's *Torymus caliginosus.* 2. *Mesopolobus* is not at all allied to *Pachylarthrus;* the abdomen is sessile;—the species described, *M. fasciiventris,* is very abundant in the vicinity of London. 3. *Platymesopus;* one species of this genus is very common near London in May; the *mesotibiæ*

in the female are not dilated. 4. *Gastrocistrus;* in this genus the second and third joints of the antennæ are very minute; it has more affinity to *Spalangia* than to *Callimome* or *Eupelmus*. 5. *Trichogramma;* the species described is only one-seventh of a line in length; it has the *scutum* of the *mesothorax* very much developed, the *scutellum* very small; we believe its *tarsi* are tetramerous. 6. *Aprostocetus*, likewise, has the *tarsi* tetramerous; the oviduct is exserted. 7. *Embolemus;* a singular genus, having wings like *Alysia;* and *antennæ* like *Proctrotrupes*. 8. *Hemisius;* allied to *Telenomus*, Haliday.

Art. LXII.—*Entomological Notes.* By Edward Newman, Esq., F.L.S.

(*Continued from page* 416.)

Class.—Diptera.

Natural Order.— ———? *ined.*

Genus.—Tephritis. *Latreille.*

Teph. Alciphron. Fem. *Griseo-viridis; proalis hyalinis, maculis 4 marginalibus fuscis.*

Head, between the eyes, deep ochreous; mesothorax, grey-green approaching to brown after death; it has several darker shades, and two black spots, near the hinder margin of its scutum; the segments then are greenish-brown and unicolorous to the telum, which is, in the female, elongate, and of a clear ferruginous brown. The wings are clear, with the exception of four small fuscous spots either on or near their upper margin; the first of these is situated half-way from the insertion towards the tip, and is quite marginal; the second is a little farther from the insertion, and not quite marginal; the third and fourth are still exterior, and are perfectly marginal. The legs are brown. (Breadth 5 lin.)

Taken in June, July, and August, in the Isle of Wight, Coombe, Birch, and Darent woods, on the *Centaurea nigra;* in size and form it much resembles *Teph. Cornuta.*

Teph. Theora. *Obscure griseo-viridis; fem. telo nigro; proalis fusco reticulatis.*

Head, between the eyes, somewhat ochreous; mesothorax and following segments, dirty greyish-green, until the telum, which in the females is black; wings reticulated with brown, which forms a stronger double irregular blotch on the costal margin; another near the middle of the lower margin, and a third towards the tip;—these three are at their edges united. The legs are pale. (Breadth 3½ lin.) (*Mus. Soc. Ent.*)

This insect is nearly allied to *Teph. Leontodontis* of Meigen, than which however it is less, and, in other respects, sufficiently distinct. It is also related to *Teph. flavicauda* of Meigen, from which it is readily distinguished by the colour of the terminal segment; the three or four segments before these have occasionally a pair of black dots on each. It is one of the commonest species in Britain, having been taken in abundance in Scotland, Cambridgeshire, Oxfordshire, &c., and in the neighbourhood of London, at Hampstead, Southgate, Coombe, Camberwell, Deptford, Birch, and Darent.

Teph. Alethe. *Nigra, proalis nigro contaminatis.*

Entirely black; wings reticulated, and clouded with black. (Breadth 3 lin.) (*Mus. Soc. Ent.*)

Taken at Birch-Wood and at Southgate, in considerable abundance, somewhat resembling *Teph. flavicauda* in the markings of its wings, but is constantly less.

Teph. Hebe. *Brunnea; mesothoracis scutello*[a] *ochraceo; proalis hyalinis fasciis sex brunneis longitudine variis.*

Brown; with the head between the eyes, and the legs paler; the scutellum of the mesothorax ochraceous: the wings are very transparent, with six transverse fasciæ, and the costal margin brown, — the first, counting from the insertion of the wing, is broad, obscure, and extends from margin to margin; the remaining five are very distinct; the second is medial, not reaching either margin; the third touches the upper margin, and extends three-parts of the way towards the lower; the fourth is very short,

[a] I use the term *scutellum* more in conformity with general practice than to express any belief of my own in its accuracy. I suspect the part in question will prove the fourth section of this segment, or the *mesothoracic postscutellum.* I prefer, however, adhering to a possible error, to the risk of falling into a new one.

touching the upper margin only; the fifth is very long, attached to the upper margin, and, at half its length, taking a bend towards the body of the insect; the sixth resembles the fourth, and is nearly apical.

Taken by Mr. Walker at Southgate. I have seen but one specimen of this very beautiful insect.

NATURAL ORDER.—MUSCITES, *ined.*

GENUS.—TRIXA. *Meigen.*

Trix. scutellata. *Nigra; mesothoracis scutello, pedibusque ferrugineis.*

Black, slightly clouded and variegated with grey: head, above, black; below, including the front and antennæ, ferruginous: mesothoracic scutellum, and legs, also ferruginous: the remainder of the trunk black: wings, exteriorly, smoky; interiorly, the upper portion stained with saffron. (Breadth 1 inch.)

Taken in Epping Forest by Mr. Doubleday.

CLASS.—COLEOPTERA.

NATURAL ORDER.—SILPHITES, *ined.*

GENUS.—CATOPS. *Paykul.*

Cat. nubifer. *Fuscus; prothorace medio fusco, lateribus ferrugineis.*

Head black: antennæ, with the three basal joints, pale ferruginous, and shining; then, to the apex, fuscous, with the exception of the apical joint, which is paler: prothorax ferruginous, bearing a fuscous cloud centrally, which extends to none of its margins: mesothorax, ferruginous: elytra fuscous: the latter, at the shoulders, more or less ferruginous, in some specimens, which are possibly immature, the latter colour pervades nearly the whole of the elytra: legs fusco-ferruginous. (Length $1\frac{1}{4}$ lin.)

Taken at Halifax; and is apparently very distinct from any species described as British.

Cat. frater. *Pullus, leviter villosus; pedibus fusco-ferrugineis.*

Head black; antennæ, with the two basal joints, ferruginous, then fuscous, with the exception of the apical joint, which is paler;

prothorax black, with a brown villosity; elytra perfectly without the usual striæ, excepting the pair which runs parallel with the suture, black, slightly tomentose and rugose; legs, fusco-ferruginous. (Length, $1\frac{3}{4}$ lin.)

Taken at Halifax. It somewhat resembles *Cat. fornicatus* at first sight, but is very much smaller, also blacker; and the elytra want the striæ, so apparent in that species, and have the appearance of rugosity, rather than reticulation, which distinguishes *C. fornicatus*. These appearances, both of reticulation and rugosity, are merely the effect of a different arrangement of minute punctures.

Cat. soror. *Niger, elytris pedibusque piceis.*

Head black; antennæ, with the four basal joints, and half of the fifth, ferruginous; prothorax black, with a brown villosity; elytra and legs pitchy-black; the former rugose, faintly striated. (Length $1\frac{1}{4}$ lin.)

Taken at Halifax. It is more round, and rather shorter in proportion than any other species with which I am acquainted. The antennæ also differ; but the general appearance of this, and the preceding species, is very similar excepting in size; the present is the smaller. These three species are in the cabinet of Mr. Davis.

NATURAL ORDER.—BYRRHITES, *incd.*

GENUS.—BYRRHUS. *Linnæus.*

Byr. rufiventer. *Aureo-fuscus, tomentosus; ventre pedibusque ferrugineis.*

Head, prothorax, and elytra, brown, with a villosity of a golden-brown hue; antennæ black; the whole under-surface and legs ferruginous. (Length $3\frac{1}{2}$ lin.)

Taken round London, and in many other situations, in abundance; it has usually been confounded with *B. pilula*; than which, however, it is smaller, rounder, and different, in being invariably of a clear red-brown beneath; whereas, *B. pilula*, in the same parts, is invariably jet-black. I find, by having kept specimens alive, that age does not incline the two species to assimilate.

NATURAL ORDER.—SCARABÆITES, *ined.*

GENUS.—PHYLLOPERTHA. *Kirby.*

Phyl. suturalis. *Chalybeo-atra; elytris testaceis, margine circumdata nigra.*

Head black, with a chalybeous tinge: antennæ, with the shaft, testaceous, the club black: prothorax and mesothorax black, with a chalybeous tinge: elytra testaceous, with black hairs, and the entire margins black: the legs and whole of the under-surface are black, with testaceous hairs. (Length $3\frac{1}{2}$ lin.) (*Mus. Soc. Ent.*)

Taken by Mr. Bevington, in immense profusion, on the sea-coast in the north of Ireland. In the black line, which completely surrounds each elytron, and the black hirsuties of the elytra, it differs from every species with which I am acquainted.

NATURAL ORDER.—ELATERITES, *ined.*

GENUS.—ATHOÜS. *Eschscholtz.*

Ath. Campyloides. *Ferrugineus, oculis nigris.*

Ferruginous, the eyes only being black. (Length $4\frac{1}{2}$ lin.)

This species was beaten out of elder, at Ramsgate, by my friend, R. Foster; it appears distinct from the *Elater longicollis* of Fabricius, in having the elytra less deeply striated and less flat, and in being altogether wider; the prothorax is not quite so acutely angled posteriorly, and the general appearance of the insect is that of *Campylus dispar*. I have but three specimens, all of which agree in the above distinctions, and also in wanting entirely the margin which usually distinguishes *E. longicollis*.

NATURAL ORDER.—CERAMBICITES, *ined.*

GENUS.—CYLINDERA.[b] *Newman.*

Caput prothoracis latitudo: oculi prominentes: antennarum articulis 1°. paullò incrassato, 2°. parvo, cæteris ad apicem pedetentim attenuantibus: prothorax elongatus fere cylindricus medio paullò incrassatus: elytra parallela: femora incrassata. Characteribus aliis vix *Callidio* differt.

[b] Κυλινδρος *cylindrus*, δερη *collum*.

Cyl. pallida. *Testacea, oculis fuscis.*

The head, antennæ, prothorax, elytra, and legs, are entirely of a pale brown colour; the eyes alone are darker: the prothorax and elytra are slightly rugose; the former has an indented ring near the anterior, and another near the posterior, margin. (Length 4 lin.)

Mr. Bently's rich cabinet contains a specimen of this insect. Mr. Ingpen has taken it more than once, and I possess one which was taken at Camberwell. I have reason to believe that it is not an uncommon insect, but, from a similarity of colour, has been taken for *Callidium variabile*, a species to which widely differing insects appear to have been frequently referred.

Genus.—Tritomacrus.[c] *Newman.*

Caput prothorace paullò angustius: mandibulis elongatis, porrectis, vix dentatis, apice arcuatis: oculi prominentes: antennis corpore valdè longioribus, articulo 1°. incrassato, 2°. brevissimo, 3°. longissimo, cæteris longitudine decrescentibus, et ad apicem pedetentim attenuantibus: prothorax elongatus, depressus, indentatus, lateribus convexis: elytra postice paullò angustiora; femora præcedente minus incrassata. Characteribus aliis vix *Obrione* differt.

Trito. testaceus. *Testaceus, oculis fere concoloribus, antennis corpore valde longioribus.*

Testaceous, the eyes being nearly of the same colour: the antennæ are much longer than the body, pubescent, and taper gradually to a point. (Length 5 lin.; antennæ 8 lin.)

The only specimen I have seen of *Tritomacrus testaceus* is in Mr. Bently's cabinet, and named *Obrium pallidum;* it was taken by Mr. Whitecroft, in Ireland. I should have been very glad to have retained the specific name, but thought it more applicable to the preceding species, and did not like to give them both the same name. From the descriptions, I think it will be seen, that *Tritomacrus* is more nearly allied to *Obrium*, *Cylindera* to *Callidium*, forming, together with those genera, a beautifully connected series.

[c] Τριτος *tertius*, μακρος *longus*:—third joint long; in all the Cerambicites *this* is partially the case, but in the present instance very remarkably so.

Class.—Neuroptera.

Natural Order.—Libellulites, *ined.*

Genus *Libellulam* ut a Doct. Leach circumscriptum, audendo iterum dividere in terram ambiguam periclitor: nihilominus mihi videtur, character unicus "*metalæ sexibus ambobus compares*" non sufficit, propterea distinctiones novas in corporis figuram conditas, attentavi: instrumenta cibaria haud examinavi, quoniam genus satis determinatum instanter universus monstrat aspectus, sanciuntque characteres enumerati existimo.

Genus.—Sympetrum.[d] *Newman.*

Caput metathorace latius: propodeon, podeonque in commisura incrassata: segmenta sequentia lateribus compressa: protelum ac adjacentia plus minusve incrassata: tetum minutum: teli appendices notas cæteris distinctas vix præbent: alarum stigma utrinque convexum.

The remaining species of Dr. Leach's genus, *Libellula*, widely differ from each other in the form of the posterior segments, and in the length of the superior caudal appendages of the male; but in none of them are these segments compressed as in the genus *Sympetrum;* they will, in all probability, resolve eventually into three distinct genera, and as such I had once prepared them for publication, together with *Sympetrum*, as below,[e] but a dislike to name-giving induced me to relinquish them.

A. *Sexus colore discrepantes.*

Symp. Scoticum. Mas, *purpureo-nigrum, maculis flavis; alis hyalinis: pedibus nigris.* Fem. *olivaceum, maculis flavis: subtus nigrum; alis hyalinis basi flavis.* Mas et Fem. *stigmate nigro, pedibus nigris.*

[d] Συμπιεζω *comprimo*, ητρον *abdomen.*

[e] *Sympetrum;* abdomen laterally compressed. Ex. *Vulgatum*, Linn. &c.
Orthetrum; abdomen laterally parallel. Ex. *Cærulescens*, Fab. *Cancellatum*, Linn.
Platetrum; abdomen depressed and dilated. Ex. *Depressum*, Linn. *Conspurcatum*, Linn.
Leptetrum; abdomen conical and pointed. Ex. *Quadrimacutum*, Linn. *Prænubilum*, Newman.

I may add that it is with great pleasure I have seen the divisions of Clairville's genus, *Colymbetes*, lately raised by our friends on the continent to the rank of genera. They had long since been similarly divided and labelled with MS. names in my own cabinet—causing much good-humoured raillery among my acquaintance, at my love of making divisions.

Libellula Scotica. *Leach.* E. E. IX. 136, *descr.*
Id. *Donovan.* XV. Pl. 523, *icon.*

Male, purply-black, with an oblique, yellow, elongate blotch on the mesothorax; another on the metathorax, besides several smaller spots of the same colour: the decaton and protelum likewise bear on each two distinct yellow spots: the wings are very clear, without any saffron tint at the base. *Female*, olivaceous, with the yellow spots on the anterior segments, as in the male; the posterior segments having the inferior portion black. The male and female have the stigma of the wings, and the legs, entirely black. (Length 12½ lin.; breadth 19 lin.) (*Mus. Soc. Ent.*)

Taken in Scotland and some parts of England.

Symp. rufo-stigma. Mas. *Rufum.* Fem. *Olivaceum linea dorsali nigra.* Mas et Fem. *Alis sordide hyalinis basi croceis stigmate, maribus præcipue, rufo; pedibus nigris.*

Male, brilliant red. *Female*, olivaceous, the lateral portions of the meso- and metathorax inclining to yellow, variegated with black oblique lines: the acute keel of the posterior segments is tipped with black, the lower portion is also inclining to black. In both sexes the wings have a tinge of brown over the whole surface, and a saffron-coloured spot at their base: the stigma of the males, particularly, is bright red: the legs are black, with the under surface of the profemora in the females excepted, which is yellow. (Length 13 lin.; breadth 21 lin.) (*Mus. Soc. Ent.*)

This species is particularly abundant. I have examined no London collection without observing specimens of it; it is not allied to any described species; the red male instantly distinguishes it from *S. Scoticum*, the black legs and diminutive size from *S. vulgatum.*

Symp. vulgatum. Mas. *Rufescens.* Fem. *Olivaceum: alis sordidè hyalinis basi vix croceis, stigmate infumato; femoribus tibiisque flavis, lineis nigris; tarsis nigris.*

Libellula vulgata. *Linn. Syst. Nat.* I. 901? (alis hyalinis corpore griseo cauda simplici.)
Id. *Fab. Lat. Charp, Vand*, &c.
Id. *Schœff*, Tab. 92, fig. 1 (mas); Tab. 137, fig. 1 (fem.): *icon.*

Male, red. *Female*, olivaceous, the lateral portions of the meso- and metathorax inclining to yellow, and streaked with black; a

slender black line passes centrally along the sides of the posterior segments, though occasionally interrupted; another black line, below this, is never interrupted: the wings in both sexes have a saffron tinge at the base,—in the females, extending along the costal margin: the stigma is smoke colour: the legs are yellow, with slender black lines, excepting the tarsi, which are totally black. (Length 16 to 17 lin.; breadth 25 lin.)

This species is also abundant round London, but never seen in company with the last. I have examined the authentic Linnæan specimen, and find it does not perfectly agree with this insect; but probably time has so altered its colours, that it would be scarcely fair to introduce a new name.

Sexus colore assimilantes.

Symp. basale. Mas et Fem. *Flavescens; alis, basi et marginibus costalibus, croceo tenuiter suffusis, stigmate infumato, pedibus nigris, profemoribus subtus flavis.*

Libel. basalis. *Steph. Syst. Cat.* I. 309.

Male and *female*, dull yellow, approaching in parts to olivaceous: a series of irregular black spots, on the sides of the posterior segments, form an interrupted line: the meso- and metathorax are likewise marked with black, in the same manner as *Symp. vulgatum:* the wings are beautifully stained with saffron-colour at the base, and along the costal margin: the stigma is smoke-coloured: the legs are black, with the exception of the under surface of the profemora, in the female, which is yellow, and the coxæ and trochanteres, which are of peculiarly pale and delicate straw-colour. (Length 15 lin.; breadth 22 lin.)

Mr. Stephens, who kindly transmitted me his typical specimen, has the credit of first noticing this species as distinct from the others, and I have adopted his name, although I should have preferred a more distinguishing one, as the one he has chosen is more or less applicable to every species of the restricted genus *Libellula*. It does not appear an abundant species, though occasionally found near London. I have never met with it.

Symp. flaveolatum. Mas et Fem. *Flavescens; alis, metalis præsertim, latè croceis; stigmate flavo; pedibus nigris extus flavo lineatis.*

Libellula flaveolata. *Linn. Faun. Suec., descr.*
flaveola. *Fab. Latr. Charp. Vand.*, &c.
Id. *Schœff.*, Tab. 4, fig. 1, *icon.*

Male and *female*, yellow, with a continuous black line extending on each side from the metathorax to the telum: fore-wings with a saffron-coloured blotch at the base, and another, in the *females*, near the centre of the upper margin: hind-wings with a large blotch of the same colour at the base: stigma opaque, straw-coloured: legs black, with a yellow line externally on the femora and tarsi. (Length 15 lin.; breadth 22½ lin.)

Taken, but rarely, in the neighbourhood of London; more abundant in Scotland. Most of these species vary in the disposition and mode of marking; they are also subject to have pale legs, when killed immediately on emerging from the pupa, and to change their colour by being kept: if due allowance is not made for these variations, much confusion will ensue. I shall feel obliged to any of your correspondents who can supply me with either of the two last described species, or any remarkable *Libellulites*, on loan.

Should these Notes meet with approbation, I hope, in another volume, to renew them, having made but slender progress with the stores on hand.

EDWARD NEWMAN.

ART. LXIII.—*Varieties.*

46. *Moths attracted by Sugar*, (Vid. ante, p. 310.)—I have observed that the bottles filled with sugar and water which are frequently hung against walls to attract wasps, and so preserve the wall-fruit, will attract moths also. I once knew an instance of *Catocala nupta* getting into one of them. If sugar barrels are heated, they will attract moths much sooner than when cold; some gauze should be so placed as to prevent the moths from injuring themselves, and a person should stand near with a net ready. *Sphinges*, and other moths, come to feed on honeysuckles and all sweet flowers.

J. C. DALE.

47. *Names of Captain Blomer's Insects*, (Vid. ante, p. 317.)—As some doubt seems to be attached to the names sent by Captain Blomer to the Entomological Magazine, I

may state, that the Captain sent them to me for names, and I beg to make a few corrections. *Polia bicaudata* should be *Perla bicaudata; Ceria conopsoides* should be *Doros conopseus; Bombus Harrisellus* should be *B. subterraneus; Osmia maritima* should be *Megachile maritima; Andrena aurata* should be *A. armata; Tabanus vittatus* is in Curtis's Guide, G. 1185, Sp. 5. The remainder I cannot at present explain.

J. C. Dale.

48. *Acanthosoma picta,* (Vid. ante, p. 287.)—I saw this insect, with the same name attached, in the Linnæan cabinet. I took four or five in Middleton Park, near Oxford, on the juniper-bushes; and Mr. Matthews has taken them through last winter in great abundance at the same place.

J. C. Dale.

49. *Genus Charissa.*—I have taken *C. serotinaria* on a chalk soil, as in the Isle of Wight, for instance, and always whitish; *C. Pullaria,* on stony chalk, at Dover, is rather darker; and another variety, on Portland stone, darker still; besides a variety at Monk's Wood, which appears intermediate. I have taken *C. dilucidaria* at Teignmouth, between grass and heath; and one, very nearly allied, on the Mendip Hills, out of furze and on old walls. *C. obscuraria,* which I have taken on Parley Heath, is very dark indeed. Is it not possible that all these are but one species?

J. C. Dale.

50. *Genus Carabus.*—I first detected *C. cancellatus* as being distinct as British, in Mr. Ingpen's cabinet, where it was ticketed *C. monilis,* and had been overlooked by several entomologists for some time previously. *C. auratus* is stated to have been found at Exmouth. On looking at the cabinet of insects in the British Museum, I find a specimen of this insect ticketed thus, "*Ex Mus. D. Pitt qui legit prope Exeter.*" Mr. Wailes has also a specimen, found by a gentleman near Canterbury, and conveyed home in a snuff-box.

J. C. Dale.

51. *Generic Names should be of Greek derivation,* (Vid. ante, p. 314.) Sir, The zeal of Δ, in support of this canon,

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has led him into the inadvertence of charging to my friend, Mr. Curtis, as an innovation, a practice adopted by many other of the most eminent entomologists. As Δ seems to restrict his remarks to the present practice, it is needless to go back to the authority of Linné or Fabricius; but opening the entomological parts of Le Règne Animal, and Stephens's Catalogue, I take a few out of the numerous examples I find there, not to defend the principle, but to shew how far it is an innovation. Yours, &c. A. H. Haliday.

[Mr. Haliday gives a considerable list from Latreille, Lamarck, Stephens, &c., of generic names decidedly of Latin origin; it is no innovation, yet still we are disposed to recommend the use of Greek-compounded words in preference.—Ed.]

52. *Burrowing Hymenoptera.*—Sir, The following brief enumeration comprehends all the *Hymenoptera* of the burrowing tribes which have occurred to me on the eastern coast of Ireland, from Dublin northwards:—*Ceropales maculatus; Pompilus pulcher, niger, gibbus, fuscus, exaltatus; Larra ichneumoniformis*; Mellinus arvensis; Stigmus Troglodytes*; Pemphredon lugubris*, unicolor; Crabro 4-maculatus, palmipes, elongatulus*, bidens*,* (Haliday); *Rhopalum tibiale*, rufiventre*; Oxybellus uniglumis.* Of *Crabro bidens,* I subjoin the following description:—

Cra. bidens. Mas. *Niger, nitidissimus; capite, thoraceque pubescentibus, ocellis in triangulum æquilatus positis, clypeus utrinque mucronato, abdomine latitudine et longitudidine thoracis.*

Statura et magnitudo *Cr. Leucostomæ* caput robustum, supra subquadratum, fusco pubescens, facie ut in reliquis argentea: antennæ breviusculæ, haut ciliatæ; metathorax breviter rotundatus, lævis sulculo medio longitudinali, scutello (cordiformi) indistincto; abdomen fere latitudine thoracis et vix longius, nitidissimum, apice flavescenti-pellucido; pedes graciles coxis haud lanatis, metatarso antico lineari recto, calcaribus posticis dilutius fuscis.

Taken on the sand-hills, Bay of Dundrum; August.

A. H. Haliday.

53. *Observations respecting the Genus Castnia,* (Vid. ante, p. 309.)—Sir, When I alluded to the fact that *Castnia* sits with its wings deflexed, I was not aware that Mr. Swainson

had recorded it in his "Zoological Illustrations," or I should have alluded to him with all the respect due to one of no little knowledge in entomology, and who is justly regarded on the continent as the first ornithologist of Great Britain. I may just say, that I have more than once seen *Castnia* sitting with its wings deflexed, and that I hope ere long to see it again, if any are yet to be found in a land far dearer to me

"——— in its darkness and showers,
Than the rest of the world in its sunniest hours."

I am, Sir,

THE ANONYMOUS REVIEWER OF SPHINX V.

—— *Hall, April* 15, 1833.

54. *Observations on Mr Newman's Osteology*, (Vid. ante, p. 409.)—SIR, It was my wish to have made an observation or two on Mr. Westwood's article (XLI.); but, as I may give offence, I shall confine myself to Mr. Newman's Osteology. I know not how Mr. Newman can have made so great a mistake, as to state that the anterior wings, or *pseudelytra*, in *Strepsiptera*, were attached to the *prothorax*; such certainly was the opinion of Mr. Kirby and of M. Latreille, but *I* had the good fortune to clear up the doubt by dissection, and in the three genera I have published, it is distinctly stated in the letter-press, that they are attached to the *mesothorax*; Mr. Newman has unfortunately referred to my genera *Elenchus* and *Halictophagus*, and I had not sufficient materials to illustrate those interesting genera so fully as might have been wished; but if Mr. Newman will do me the favour to refer to the genus *Stylops*, which I engraved myself that it might be accurate, and published in August 1828, he will see the different parts of the insect separated, and placed in their relative positions; and at figures D. 9. and K. 9. the *pseudelytra* are represented attached to the *mesothorax*. This being the only insect of the order I have had an opportunity of fairly investigating, any trifling errors in the other two genera must be attributed to the want of materials for examination; and I have stated in my remarks upon *Halictophagus* (folio 433[b]), alluding to the situation of the *pseudelytra*, "they are so placed that, without dissecting the *Stylops*, it would be utterly impossible to ascertain to what part they were attached."

I am, Sir, yours, &c. JOHN CURTIS.

Upper Charlotte Street, 23d of August, 1833.

55. *Insensibility in Insects.* (Vide ante p. 105.)—Sir, A word with reference to Mr. Bird's interesting paper on the sensations of insects. On the 5th of July last, while resting from the heat and fatigue of the morning in the midst of the fens near Whittlesea Mere, I caught a dragon-fly, (*Æschna maculatissima*, Lat.), which was temporarily reposing on a blade of grass near me, and I was induced to try an experiment with it in regard to its sense of feeling. I held the insect by the wings, and then directed its tail to its mouth, anticipating, from the pre-eminent voracity of these insects, it would at least attempt to bite itself; but, to my astonishment, it not only seized upon its caudal appendages, but actually bit off a portion, which it swallowed, and proceeded gradually to consume its body until the four terminal segments thereof were completely eaten up!—by accident the insect then escaped, and fled away as briskly as ever! Does not this experiment obviously show that the sense of feeling in insects, (if it exist at all,) must be extremely obtuse?

J. F. Stephens.

56. *Portrait of Lord Brougham.*—On the reverse, as a medalist would say, of *Hipparchia Janira*, is to be traced a very tolerably defined profile, in some specimens no very bad likeness, of the Lord Chancellor Brougham. If this curious feature in a very common butterfly has not before been noticed, which I believe to be the case, perhaps it may be admitted as a "Variety" in a corner of the Entomological.

I am, respectfully, Tyrensis.

Lark-hall Lane, Clapham,
Aug. 12, 1833.

57. *Public Entomological Collection.*—Sir, May I venture a suggestion, which perhaps may appear futile or impracticable? In justice to those who undertake the elucidation of some extensive branch of entomology, or the more arduous labour of a *Fauna*, as one of the irregulars of the camp, I feel it imperative on us, if we do nothing in clearing, at least not to contribute towards encumbering the Augean stable. Were there any public collection in which the describers of new genera and species might deposit examples, labelled with the names, adding to their lucubrations a reference to such cabinet,

or enumerating in the Entomological Magazine the deposits made; it would, I imagine, prove a facility to future inquirers, at least with regard to such species as are not rare, and therefore of most importance. I doubt not that the possessors, even of unique specimens, although they may be unwilling to transfer them to other private collections with equal risk of dispersion, would in many cases cheerfully yield them for the sake of more permanent utility. In order to put this idea into practice, it would be necessary to find some depôt where such would obtain room, and be generally accessible; and being unacquainted with the state and economy of the musea of the metropolis, I do not know if these requisites could be fulfilled.

Yours, &c. A. H. Haliday.

[The establishment of the Entomological Society exactly supplies the *desideratum;* if it will be any convenience to our correspondents to transmit through our hands any contributions to the general collection now forming by the Society, we shall feel gratified in obliging both the donors and the Society.—Ed.]

58. *Rather remarkable Beehive.*—For some years past a swarm of bees has been observed about the chimney of the Robin Hood public-house in Bedford; on removing some bricks from a cavity or dumb chimney yesterday se'nnight, three regular tiers of combs were found, from which was extracted between thirty and forty pounds of honey. It is calculated that this industrious fraternity has sojourned in this singular retreat for the last eleven years. — *Northampton Mercury.*

59. *Moths swallowed alive.*—I was surprised the other evening on looking at a *Caprimulgus*, which my brother had shot in the forest, to see a moth come out of its mouth, perfectly alive, and fly away: and, what is still more remarkable, on opening the crop the next morning, it contained several other moths, all *Noctuites*, which had lived all night in this strange prison, and when thus released, ran about the table fluttering their wings.

Edward Doubleday.

60. *Wire-worm.*—Sir, I take the liberty of inclosing you a couple of what I believe are wireworms, and which are commonly called so in this neighbourhood. Whatever they may

be, their ravages for many years have been very considerable. Wheat and potatoes are the great objects of their attack: wheat is cut through towards the crown of the root; the potatoes are not sensibly affected in their growth, but when dry in the autumn are found to be much hollowed. Grass-land I have never seen injured here by any grub; we have no old meadow; our general system is the convertible husbandry,—three years ley, and then two or three course crops. The ravages of these grubs are partial; some fields are laid waste, while others, within a quarter of a mile, remain perfectly free from them; again, they continue for some years in one place, and then disappear.

J. P— Boskenna.

61. *Wireworm?* — Another grub closely resembling the enclosed, but in reality different, is found amongst the wireworms; but I cannot at this moment procure a specimen: these grubs appeared in a ley field which had been pared by a breast-plough in February last. On moving the paring about six weeks afterwards, in order to burn it, the grubs were found collected in great numbers immediately under; the opportunity of destroying them was not lost, but several still appeared in ploughing the ground. My principal object in addressing you is to inquire, whether any effectual and economical method is known of stopping the progress of this ravager?

J. P— Boskenna.

62. *Turnip-fly.*—In common with other parts of the country, we suffer severely from the turnip-fly (*Haltica Nemorum.*) They are discovered easily enough in the turnip-grounds, but unhappily we are not acquainted with any means of checking them, with the exception of elder-bushes; and these, however, are very inefficient remedies for the evil.

J. P— Boskenna.

[The writer of these remarks and queries particularly enjoins non-publication; we should however consider ourselves unpardonable in withholding them. We hope our correspondent will furnish us with a sheet-full of such notes for every number;—he will not only elicit information from others, but he is himself giving information. We should prefer publishing his name, but will not insist on that.—Ed.]

63. *Inquiry respecting Ants.*—Sir, I shall feel obliged by your asking, as an anonymous query in your valuable magazine, whether any mode of destroying ants in gardens is known. G. T.

Bristol.

64. *Genus Altica.*—Sir, Allow me to comment on the mode of spelling *Haltica*, adopted by yourself at p. 364. It certainly should be *Haltica*, if it means "given to jumping,"—ἁλτικα, the original word, having the aspirate corresponding to our *h*. C. S. Bird.

Burghfield, 2d July, 1833.

[We feel obliged to the Rev. Mr. Bird for this criticism, which is classically a correct, scientifically and technically an erroneous one: there are many generic names to which we should be glad to apply the laws of elegance, euphony, &c.—but we must bow to custom. Mr. Bird, perhaps, may not be aware, that *Altica*, not *Haltica*, is the original name;—it strikes us, at this moment, that he may have supposed us guilty of an innovation of which we had no idea.—Ed.]

65. *Entomological Society.*—Sir, In the account that you gave us at p. 390 of the formation of the Entomological Society of London, you state that all the entomologists whose addresses could be obtained received notices that such was to take place:—now, Sir, I must beg you will contradict that statement; for there are four practical entomologists with whom I am acquainted, as well as myself, that received no such notice, whose addresses were well known. You will oblige many of your entomological readers by giving publicity to this; for, to them, it does appear there has been great neglect, or party feeling has actuated some of the officers.

J. Chant.

3, *Critchell Place, New North Road,*
August, 1833.

[We have received many other letters on this subject, some abusive ones, and all but Mr. Chant's nameless. Mr. Chant is quite right and justified in taking up the matter in the open, manly, and spirited manner which he has done; and we willingly retract our assertion, that invitations were sent "to all

entomologists whose addresses could be obtained:" such ought to have been the case; and we presumed too readily that it was so;—but we must add our firm conviction, that there was no other reason for the omission, so justly complained of, than the neglect of the parties by whom the task was undertaken; the *onus* is not with the Society, or any of its officers,—for let us call to Mr. Chant's recollection, that the Entomological Society dates its existence from the day on which the meeting we gave an account of was held at the Thatched House;—at *that meeting* the officers were appointed;—before *that meeting*, therefore, there could be no officers; and whatever party feeling was exhibited previously is not chargeable on the officers then appointed;—*we know of no such feeling*;—and, did it exist, there is no more effectual way of *annihilating* it than for all honest and independent men, like Mr. Chant, to join the Society instantly; and, by a majority of votes, stultify all attempts at illiberal measures, supposing that any should be proposed. We appeal to Mr. Chant's good sense, whether he ought to say "party feeling has actuated some of the officers," when he confessedly refers to what took place before those officers were even thought of. We hope to see Mr. Chant and his four friends, at eight o'clock on the first Monday in November, enter *all* their names, as original members, at 17, Old Bond Street; and we hope we may meet them, and all other right-spirited entomologists, on the first Monday of every succeeding month, for many, many years.—Ed.]

66. *Observations on Varieties.* — Sir, Every entomologist resident in the country, who consequently has not the privilege of inspecting, any day, the unrivalled cabinet of Mr. Stephens, or some other of the larger metropolitan collections, must frequently be at a loss to satisfy himself whether any variety of the species of an insect differing much from the type, especially amongst the *Noctuidæ* and subsequent families of the *Lepidoptera*, is in reality a mere variety, or an undescribed species. On the other hand, the London entomologists, from the nice distinctions which the number of species they possess enables them to draw, are too ready to consider such varieties as distinct species, especially if the insect is not found near town; and few specimens have got into their cabinets. I need not here allude to the numerous supposed species of the

genus *Agrotis*, which Mr. Haworth describes, and which have now been satisfactorily reunited, but would only refer to one or two recent instances. *Polia Chi* is stated to be almost peculiar to the more northern parts of this island; and, I presume, most of the specimens found in the London cabinets have been collected in Derbyshire and Yorkshire. The great uniformity in the general colouring of these specimens would almost induce one to suppose they had been taken by only a few collectors. It was not therefore much to be wondered at, that Mr. Curtis should have pronounced one of the dark varieties a new species, nor that Mr. Stephens, having never seen the collecting links, should subsequently have described a similar variety received from Edinburgh, under the name of *P. olivacea*. Near Newcastle the insect is rather common, and occurs of every shade, from the hoary tinge of what is described as the typical variety in Mr. Stephens' Illustrations, or even from an almost pure white, to the olive-green of his *P. olivacea*. The diversity of colouring in an extensive series is really beautiful; for, besides meeting with specimens of both sexes, having all the wings dark-coloured, or dark anterior and light posterior, and *vice-versâ*, or all light coloured, some are scattered over with fulvous spots, like *P. dysodea*, whilst, in others, the strong black markings form a striking contrast with the hoary tints of the wing. In fact, scarcely two specimens are precisely similar. It has generally been supposed that the *larva* of this moth feeds on the *Sonchi*, *Lactucæ*, &c.:—but I am inclined to believe that its food is lichens. My reason is, that the perfect insect, when discovered in repose,[a] is always to be met with on walls overgrown with lichens; and every entomologist knows that moths in general, with the exception of the species whose larvæ feed on the *Cryptogamia* encrusting stones, or at least are presumed to do so as the *Bryophilæ*, *Alcis muraria*, *Aplocera cæsiata*, &c., dislike roosting on stones. Besides, I have taken specimens in such situations so very recent, that they could not have quitted the pupa state more than a few minutes previously. I regret that my attempts to rear the insect from the egg, or to discover the larvæ, have hitherto been unsuccessful.

[a] I never knew of more than a single example being taken on the wing, and that was in the immediate vicinity of the park-wall at Meldon, which is a very ancient one.

Like most other moths, *Polia Chi* may be found in the winged state for several weeks; and I consider its season as extending from the middle of August to the middle or latter end of October.

Mr. Curtis has, from a similar paucity of specimens, fallen into an error in describing as a new species *Chareas Hibernica*. His insect is only *C. graminis*, which is subject to considerable variation in the light or antler-shaped markings of the anterior wings. I was very much struck with the size of the specimen figured by Mr. Curtis; but he shewed me another of the usual variety, quite as large, captured by himself in Norfolk. Either the climate must have had great influence, or the particular *larvæ* from which the above were produced, must have been, *par excellence*, gourmands; for I never took a specimen hereabouts much exceeding 1 inch 1 line from tip to tip.

GEORGE WAILES.

67. *Economy of the Hive-Bee.*—SIR, The common Hive-Bee (*Apis mellifica*, Linn.) has long and deservedly been the theme of many writers on the wonders of the Insect world. The following observations relative to it may, perhaps, prove new and not altogether uninteresting. Against the south front of our house, in the vicinity of this town, several plants of the *Passiflora cærulea*[b] are trained, which cover it to the height of some twenty feet, or thereabouts; and, from July to November, the constant succession of its beautiful flowers attract great numbers of the Hive-Bee, especially during autumn, when flowers productive of much honey are scarce. Every one knows the passion-flower, and need hardly be told that one series of the rays of the nectary closely surrounds the stipes or shaft, whilst other two are beautifully spread over the horizontal leaves of the corolla; but, perhaps, few are aware that the tube of the calyx contains several drops of pure and delicious honey. On the arrival of each Bee, I can at once tell whether it has been a prior visitor or not, by its

[b] Though foreign to Entomology, I may mention that two years ago the plants perfected their fruit, both in the open air and greenhouse, being, as that eminent horticulturist and true lover of nature, Mr. Neill, of the Canon Mills, near Edinburgh, informed me the other day, the most northern spot where they had yet done so.

mode of procedure. Should it be a first visit, the little busy creature is for a time quite at a loss: it, of course, scents the honey, but cannot discover the entrance to the store-house. Convinced that there is plenty of the object of its search in the flower, the Bee hurries over the surface in all directions, now running its head fast between the corolla and the outer double series of the rays of the nectary, now entangling itself amongst the beautiful rays themselves, and anon mounting the stipes and ransacking the parts of fructification. At length, after a bustling scene, which frequently lasts for two or three minutes, and which the Bee's certainty that honey is concealed somewhere in the neighbourhood prevents its quitting in despair, sometimes apparently by mere chance, at others by running the scent home, its indefatigable labours are rewarded. Now, with its tongue inserted amongst the rays surrounding the shaft, and past the projecting rim which almost closes the entrance to the tube of the calyx, it drinks its fill, and flies off for the hive to deposit its treasure and profit by experience on a future trip. Far different is the manner of the Bee that has been at the work before; it wastes not a moment of the time, which the approach of winter renders doubly valuable, but at once alights on the flower, runs to its centre, and plunging its tongue into the liquid sweet, hurries back loaded to the hive.

Yours, &c. GEORGE WAILES.

68. *Death of Mr. Haworth.*—Adrian Hardy Haworth, a Fellow of the Linnæan and Horticultural Societies of London, and author of *Lepidoptera Britannica*, and several Essays on various subjects connected with Zoology and Botany, died of *cholera*, on Saturday, the 24th of August, 1833, aged 66. The previous evening he had enjoyed his usual health. Mr. Haworth was sincerely and justly esteemed by a large portion of the scientific world.

69. *Discovery of Sphinx Nerii in England.*—SIR, Another addition has been made to our visiting *Sphingidæ*, by the capture of the splendid *Deilephila* (may I call it?) *Nerii*, at Dover, about ten days since. From the state of the specimen which I have this day examined it must have been very recently disclosed, the tips of its wings and the top of its head alone being slightly injured by its captor, a lady residing

in the above town. As this insect, in its larva state, feeds on an exotic plant, the *Nerium Oleander*, its appearance must be purely accidental: its geographical limits I believe terminating in the south of France. J. F. Stephens.

Sept. 16*th*, 1833.

70. *Longevity of Lepisma saccharina, and other Insects.*—Sir, Had not an unexpected occupation, incidently connected with entomology, unfortunately prevented me, I intended to have composed a short monograph upon some neglected group of insects, and to have forwarded it to you for your present volume; and my time being now fully engaged in preparing for the recommencement of my "Illustrations,"[c] still hinders me from carrying my design into execution: however, there is one subject to which I wish to direct attention, viz. the *longevity of insects*, and other annulose animals; my notice having been called thereto by the following occurrence. In June, 1831, I obtained a considerable number of the common "Wood-" or "Sugar-fish," (*Lepisma saccharina*, L.), out of a box imported from India; these were packed away in pill-boxes in a place of safety for future investigation; but, as they belonged to a group of *annulosa*, to which my attention was but slightly devoted, they were suffered to remain untouched:—my surprise was great, when, in June last, [1833], in clearing my boxes for a projected excursion to Cambridge, &c., I found one of the *Lepismæ* alive and merry, after so protracted a confinement—about two years—in the box were only a few grains of magnesia, or the white powder employed by chemists in packing their pills. I this year kept a specimen of *Cloëon pallidum*—one of the reputed short-lived *Ephemeridæ*—alive from the 20th of May to the 9th of June. In February, 1832, I saw a living specimen of *Hæmaticherus Heros*, that was taken in the preceding August at Padua; a proof that insects belonging to the section *Longicornes*, Lat., occasionally survive the winter—a fact which I believe has hitherto been doubted.[d] I

[c] A number of which, Mr. Stephens informs us, will appear on the 31st of October.—Ed.

[d] A *Saperda Carcharias*, which I bred on the 5th of July last, from a pupa that was given to me by my friend, J. A. Power, Esq., who dug it out of an aspen on the 30th of June preceding, in Bottisham Fen, died on the 24th of July following: of this insect more than 200 specimens have been taken this year.

have elsewhere mentioned the circumstance of a *Conocephalus*, now in my collection, which was caught in China, and brought alive to England, where it lived several weeks, having subsisted on tea during its captivity. *Cicadæ* and *Achetæ* have frequently been kept a long time in confinement, it is said on account of their chirping, which the natives, who thus keep them, are supposed to be very partial to; but no authentic record of the longevity of any particular individual specimen has been commemorated. The almost marvellous account by Mr. Marsham, in Vol. X. of the Linnæan Transactions, concerning a *Buprestis splendens*, which was cut out of the wood of a desk which had been upwards of thirty years in an office at Guildhall, London; and the history of a *Trogosita mauritonica*, by Mr. Kirkup, who kept it alive twenty-one months, as related in the Entomological Transactions, Vol. I. p. 329, with an additional note by my late lamented friend, A. H. Haworth, Esq., may be pointed out.

Yours, &c. J. F. Stephens.

71. *Remarkable Capture of Butterflies.*—Sir, Perhaps the following notes of the capture of about half our British butterflies, in the course of a few days, and without any particular searching for them, may be interesting; if so, they are at your service.

Papilio Machaon. The *larva* in various stages of growth on 29th June, Sedge Fen, Camb., by W. Christy, Esq.; and 4th and 5th July at Whittlesea Mere.

Gonepteryx Rhamni. W. M. 4 and 5 July; M. W. 6 July; H. 11 July.

Pontia Brassicæ, *Rapæ*, *Napi.* } W. M. not abundant; in bad condition, remains of the spring brood.

Mancipium Cardamines. W. M. 4 July; H. 10 July.

Pieris Cratægi. W. M. and M. W. 4—6 July; in great plenty, but going off.

Argynnis Aglaia. W. M. 4 and 5 July; plentiful.

Paphia. M. W. 4—6 July; H. 10—13 July; D. 18 July.

Vanessa C-album. M. W. 5 and 6 July; three specimens.

Io. Ramsgate, 17 July; Coombe Wood, 28th; two specimens.

Vanessa Urticæ. W. M. 5 and 6 July; in great abundance.
Polychloros. M.W. 4 July? H. 10 and 11 July; sparingly.
Atalanta. Ramsgate, 17 July; one specimen only.
Cynthia Cardui. Madingley Wood, Cambs. 1 July; Devil's Ditch, 4 July.
Apatura Iris. M. W. 6 July; several; H. 11 and 12 July; just appearing. This insect was also taken at Caen Wood, Hampstead, in July.
Hipparchia Semele. D. 18 July; one specimen only.
Ægeria. M. W., &c. } not very common.
Megæra. M. W., &c. }
Galatea. M. W., 4 July; W.M. 5 and 6 July; H. 10—13 July; D. 18 July; abundant in each locality.
Janira, *Tithonus,* *Hyperanthus.* } M. W., &c.; common: borders of woods and meadows.
Pamphilus. H. 10—13 July; abundant.
Thecla W-album. Madingley Wood, 1 July; one specimen.
Pruni. M. W. 4—6 July; in plenty, but in shattered condition.
Quercus. H. 10—12 July; common.
Lycæna Phlæas. M. W. 4 July; H. 10 July; D. 18 July.
Dispar. W. M. 5 and 6 July; in plenty.
Polyommatus Alsus. Madingley Wood, 1 July; Dover, 18 July.
Acis. Madingley Wood, 1 July; not common.
Arion. M. W. 4 July. This insect I did not take myself; but, as I understand, a single and remarkably fine specimen was found by a labourer, and given to Mr. Strickland.
Corydon. Devil's Ditch, 4 July.
Adonis. D. 18 July; just appearing.
Alexis. M. W., &c.; common.
Argus. D. 18 July; common.
Agestis. D. 18 July; just appearing.
Thymele Tages. D. 18 July; just appearing.
Pamphila Sylvanus. M. W., &c.; common.
Linea. M. W., &c.; plentiful.

(*Note.* — W. M. Whittlesea Mere; M. W. Monk's Wood; H. Hertford; D. Dover.—*J. F. S.*)

Yours, &c. J. F. STEPHENS.

Hermitage, South Lambeth,
Aug. 31, 1833.

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DESCRIBED IN THIS VOLUME.

ISOSOMA *Walk.*
atrum *Walk.*
longulum *Dal.*
fumipenne *Walk.*
crassicorne *Walk.*
simile *Walk.*
angustipenne *Walk.*
brevicorne *Walk.*
hyalipenne *Walk.*
longicorne *Walk.*
breve *Walk.*
minor *Walk.*
elongatum *Walk.*
petiolatum *Walk.*
cornutum *Walk.*
tenuicorne *Walk.*
pusillum *Walk.*
breviventre *Walk.*
angustatum *Walk.*
dissimile *Walk.*
fulvicolle *Walk.*
depressum *Walk.*
lineare *Walk.*
attenuatum *Walk.*
SYSTOLE *Walk.*
albipennis *Walk.*
EURYTOMA *Ill.*
verticillata *Fab.*
longipennis *Walk.*
Abrotani *Panz.*
apicalis *Walk.*
curta *Walk.*
collaris *Walk.*
nitida *Walk.*
gracilis *Walk.*
annulipes *Walk.*
minuta *Walk.*
rufipes *Walk.*
DECATOMA *Spin.*
Cooperi *Curt.*
biguttata *Swed.*
obscura *Walk.*
immaculata *Walk.*
plana *Walk.*
mellea *Walk.*
variegata *Walk.*
minuta *Walk.*

unicolor *Walk.*
tenuicornis *Walk.*

ELAPHRUS *Fab.*
splendidus *Esch.*
Lapponicus *Gyll.*

BYRRHUS *Lin.*
Alpinus *Newm.*
COLYMBETES *Clair.*
Snowdonius *Newm.*

ÆGERIA *Fab.*
Apiformis *Lin.*
Bembeciformis *Hub.*
PYROPTERON *Newm.*
Chrysidiforme *De Vil.*
BEMBECIA *Hub.*
Ichneumoniformis *Fab.*
SYNANTHEDON *Hub.*
Œstriforme *Bork.*
TROCHILIUM *Scop.*
Tipuliforme *Lin.*
Muscæforme *V. T. V.*
Allantiforme *Newm.*
Sphegiforme *W. V.*
CONOPIA *Hub.*
Myopæformis *Bork.*
Formicæformis *Esp.*
Culiciformis *Lin.*
PARANTHRENE *Hub.*
Vespiformis *Lin.*

COLIAS *Fab.*
Electra *Lin.*

MEGASTIGMUS *Dal.*
transversus *Walk.*
dorsalis *Fab.*
PRIOMERUS *Walk.*
pachymerus *Walk.*
TORYMUS *Dal.*
caliginosus *Walk.*
CALLIMOME *Spin.*
regalis *Walk.*
cynipedis *Lin.*
Roboris *Walk.*

quadricolor *Walk.*
Geranii *Curt.*
pretiosus *Walk.*
Bedeguaris *Lin.*
varians *Walk.*
formosus *Walk.*
scutellaris *Walk.*
Hederæ *Walk.*
Arundinis *Curt.*
macropterus *Walk.*
flavipes *Walk.*
Dauci *Curt.*
basalis *Walk.*
confinis *Walk.*
autumnalis *Walk.*
nitens *Walk.*
brevicauda *Walk.*
abdominalis *Walk.*
mutabilis *Walk.*
microstigma *Walk.*
chloromerus *Walk.*
latus *Walk.*
microcerus *Walk.*
æqualis *Walk.*
chlorinus *Walk.*
leptocerus *Walk.*
micropterus *Walk.*
bicolor *Walk.*
leucopterus *Walk.*
viridi-æneus *Walk.*
curtus *Walk.*
meridionalis *Walk.*
Euphorbiæ *Walk.*
Capreæ *Walk.*
terminalis *Walk.*
inconspectus *Walk.*
mœstus *Walk.*
apicalis *Walk.*
affinis *Fons.*
littoralis *Walk.*
tarsalis *Walk.*
arvernicus *Walk.*
notatus *Walk.*
nigritarsus *Walk.*
straminei-tarsus *Walk.*
attenuatus *Walk.*
lætus *Walk.*
versicolor *Walk.*
fuscipennis *Walk.*
minutus *Walk.*
gracilis *Walk.*
posticus *Walk.*
exilis *Walk.*
fuscicornis *Walk.*
nitidulus *Walk.*
ater *Walk.*
pubescens *Walk.*
stigma *Fab.*
ORMYRUS *West.*
punctiger *West.*
nigro-cyaneus *Walk.*

PERILAMPUS *Lat.*
pallipes *Curt.*
nigricornis *Newm.*
Italicus *Fab.*
aureo-viridis *Step.*
auriceps *Step.*
femoralis *Step.*

CULEX
detritus *Hal.*
CERATOPOGON
distinctus *Hal.*
brachialis *Hal.*
gracilis *Hal.*
ULA *Hal.*
mollissima *Hal.*
LIMNOBIA
decora *Hal.*
senilis *Hal.*
demissa *Hal.*
pavida *Hal.*
DICRANOMYIA
oscillans *Hal.*
GERANOMYIA *Hal.*
unicolor *Hal.*
TIPULA *Lin.*
dispar *Hal.*
SCIOPHILA
pictipennis *Hal.*
ANARETE *Hal.*
candidata *Hal.*
CATOCHA *Hal.*
latipes *Hal.*
SCATOPSE
infumata *Hal.*
BIBIO
nigriventris *Hal.*
hybridus *Hal.*
CYRTOMA
melæna *Hal.*
TRICHINA
elongata *Hal.*
HILARA
matrona *Hal.*
HEMERODROMIA
melanocephala *Hal.*
HELEODROMIA *Hal.*
immaculata *Hal.*
bipunctata *Hal.*
stagnalis *Hal.*
fontinalis *Hal.*
LEPTOSCELES *Hal.*
guttata *Hal.*
irrorata *Fall.*
exoleta *Hal.*
TACHYPEZA
arenaria *Hal.*
graminum *Hal.*
umbrarum *Hal.*
PIPUNCULUS
modestus *Hal.*
exiguus *Hal.*

SPANIA
Fallenii *Hal.*
MEDETERUS
alpinus *Hal.*
DOLICHOPUS
jucundus *Hal.*
plumipes *Hal.*
litoreus *Hal.*
rupestris *Hal.*
campestris *Hal.*
patellatus *Hal.*
PIPIZA
interrupta *Hal.*
MUSCA
Chloris *Hal.*
degener *Hal.*
macellaria *Hal.*
LISPE
adscita *Hal.*
SCHOENOMYZA *Hal.*
DRYOMYZA
mollis *Hal.*
COELOPA
gravis *Hal.*
simplex *Hal.*
parvula *Hal.*
sciomyzina *Hal.*
TETANOCERA
vittata *Hal.*
PIOPHILA
luteata *Hal.*
PANDORA
basalis, *Hal.*
SEPSIS
putris *Hal.*?
superba *Hal.*
minor *Hal.*
TEPHRITIS
Plantaginis *Hal.*
LAUXANIA
amica *Hal.*
sordida *Hal.*
PHYLLOMYZA *Hal.*
HETERONEURA
spurca *Hal.*
STEGANA
annulata *Hal.*
CAMAROTA
aurifrons *Hal.*
MEROMYZA
viridula *Hal.*
CHLOROPS
lateralis *Hal.*
fulvifrons *Hal.*
agnata *Hal.*
AGROMYZA
flavo-notata *Hal.*
LEUCOPIS
obscura *Hal.*
NOTIPHILA
madizans *Fall.?*

DROSOPHILA
tristis *Fall.*
ingrata *Hal.*
melanogaster *Hal.*
cameraria *Hal.*
EPHYDRA
defecta *Hal.*
pygmæa *Hal.*
fossarum *Hal.*
Hecate *Hal.*
infecta *Hal.*
micans *Hal.*
sibilans *Hal.*
æstuans *Hal.*
paludum *Hal.*
lutosa *Hal.*
graminum *Hal.*
compta *Hal.*
interrupta *Hal.*
cesta *Hal.*
OPOMYZA
tremula *Hal.*
asteia *Hal.*
BORBORUS
hamatus *Hal.*
nivalis *Hal.*
Zosteræ *Hal.*
fuscipennis *Hal.*
vagans *Hal.*
aterrimus *Hal.*
PHORA
debilis *Hal.*
similis *Hal.*
galeata *Hal.*

EUPETHECIA
nigropunctata *Chant.*

HOLOPARAMECUS *Ct.*
Depressus *Curt.*
PARAMECOSOMA *Cur.*
Bicolor *Curt.*
LISSODEMA *Curt.*
Heyana *Curt.*
MACROCENTRUS *Cur.*
Bicolor *Curt.*
PLANCUS *Curt.*
Apicalis *Curt.*
SILO *Curt.*
Flavipes *Curt.*
RHIZOLITHA *Curt.*
LAMPETIA *Curt.*
HOMŒOSOMA *Curt.*
Gemina *Curt.*
DASYSTOMA *Curt.*
Salicella *Hub.*
CHEIMAPHASIA *Curt.*
Gelatella *Lin.*
EDERESA *Curt.*
Semitestacella *Curt.*
CHRYSOCORIS *Curt.*
Angustipenella *Guide.*

EUPTERYX *Curt.*
Hortensis *Curt.*
AMBLYCEPHALUS*Ct.*
Germari *Curt.*
AGALLIA *Curt.*
Consobrina *Curt.*
MEGOPHTHALMUS*C.*
Bipunctatus *Curt.*
PHRYNOMORPHUS*C.*
Nitidus *Curt.*
APHRODES *Curt.*
Testudo *Curt.*
CRIOMORPHUS *Curt.*
Albo-marginatus *Curt.*
GALEATUS *Curt.*
Spinifrons *Fall.*
ASPIDOTOMA *Curt.*
Capitata *Wolff.*
PANTILIUS *Curt.*
Tunicatus *Fab.*
LORICULA *Curt.*
Pselaphiformis *Curt.*
CHLAMYDATUS *Curt.*
Marginatus *Curt.*
HEBRUS *Curt.*
Pusilla *Fall.*

NOTIOPHILUS *Dum.*
aquaticus *Lin.*
metallicus *Wat.*
nitidulus *Wat.*
parallelus *Wat.*
Davisii *Wat.*
Newmanni *Wat.*
tibialis *Step.*
brevis *Wat.*
latior *Wat.*
pusillus *Wat.*
parvulus *Wat.*
rufipes *Kug.*
striatus *Wat.*
latus *Wat.*
nitidus *Wat.*
biguttatus *Fab.*
substriatus *Wat.*
Quadripunctatus *Dej.*

SEPSIS *Fall.*
cynipsea *Lin.*
fulgens *Hoff.*
hilaris *Mei.*
flavimana *Mei.*
maculipes *Walk.*
concinna *Walk.*
ruficornis *Mei.*
nigripes *Mei.*
violacea *Mei.*
punctum *Fab.*
ornata *Mei.*
NEMOPODA *Desv.*
cylindrica *Fab.*
stercoraria *Desv.*
nigricornis *Mei.*
tarsalis *Walk.*
fumipennis *Walk.*
ENICOPUS *Walk.*
annulipes *Mei.*
THEMIRA *Desv.*
putris *Lin.*
pilosa *Desv.*
minor *Hal.*
Leachi *Mei.*
SALTELLA *Desv.*
nigripes *Desv.*

HELOBIA *Leach.*
lata *Newm.*
varicornis *Newm.*
impressa *Newm.*
LEISTUS *Fröl.*
nigricans *Newm.*
Janus *Newm.*
indentatus *Newm.*
CALATHUS *Bon.*
apicalis *Newm.*
ACANTHOSOMA *Curt.*
picta *Newm.*

AMPHIBOLUS *Wat.*
atricapillus *Wat.*
HYDRÆNA *Kug.*
riparia *Kug.*
pulchella *Müll.*
concolor *Wat.*
nigropicea *Wat.*
melanocephala *Wat.*
testacea *Curt.*
nigrita *Müll.*
pygmæa *Wat.*
minutissima *Step.*
gracilis *Müll.*

SPALANGIA *Lat.*
hirta *Hal.*
nigra *Lat.*
LÆSTHIA *Hal.*
vespertina *Hal.*
PIRENE *Hal.*
varicornis *Hal.*
chalybia *Hal.*
eximia *Hal.*
graminea *Hal.*
OMPHALE *Hal.*
salicis *Hal.*
CALLEPTILES *Hal.*
latipennis *Hal.*
OOCTONUS *Hal.*
insignis *Hal.*
vulgatus *Hal.*
hemipterus *Hal.*
litoralis *Hal.*
pictus *Hal.*
LITUS *Hal.*
cynipseus *Hal.*
dimidiatus *Hal.*

ANAPHES *Hal.*
fuscipennis *Hal.*
ANAGRUS *Hal.*
atomus *Lin.*
incarnatus *Hal.*
ustulatus *Hal.*
POLYNEMA *Hal.*
ovulorum *Lin.*
pusillus *Hal.*
fuscipes *Hal.*
atratus *Hal.*
euchariformis *Hal.*
MYMAR *Hal.*
pulchellus *Hal.*
EUSTOCHUS *Hal.*
atripennis

CRATOMUS *Dalm.*
megacephalus *Fab.*
nigripes *Step.*
EPIMACRUS *Walk.*
rufus *Walk.*
SYNTOMOPUS *Walk.*
thoracicus *Walk.*
incurvus *Walk.*
DIPARA *Walk.*
petiolata *Walk.*
PSILOCERA *Walk.*
obscura *Walk.*
PROSODES *Walk.*
ater *Walk.*
MERISMUS *Walk.*
aculeatus *Walk.*
fronto *Walk.*
flavicornis *Walk.*
megapterus *Walk.*
clavicornis *Walk.*
rufipes *Walk.*
TOXEUMA *Walk.*
fuscicornis *Walk.*
Ericæ *Walk.*
CORUNA *Walk.*
clavata *Walk.*
PACHYNEURON *Walk.*
formosum *Walk.*
CYRTOGASTER *Walk.*
vulgaris *Walk.*
Scotica *Walk.*
thoracica *Walk.*
pusilla *Walk.*
clavicornis *Walk.*
obscurus *Walk.*
rufipes *Walk.*
tenuis *Walk.*
cingulipes *Walk.*

NYSSIA *Goda.*
Tau-aria *Newm.*
SIREX *Lin.*
nigricornis *Fab.*
ISOGENUS *Newm.*
nubecula *Newm.*

LIBELLULA *Lin.*
prænubila *Newm.*

DICYCLUS *Walk.*
æneus *Walk.*
fuscicornis *Walk.*
tristis *Walk.*
brevicornis *Walk.*
PACHYLARTHRUS *W.*
Smaragdinus *Curt.*
flavicornis *Hal.*
patellanus *Dal.*
MISCOGASTER *Walk.*
gibba *Walk.*
elegans *Walk.*
rufipes *Walk.*
maculata *Walk.*
fuscipennis *Walk.*
notata *Walk.*
obscura *Walk.*
fuscipes *Walk.*
obscuripennis *Walk.*
antennata *Walk.*
maculipes *Walk.*
hortensis *Walk.*
lucida *Walk.*
diffinis *Walk.*
chrysochlora *Walk.*
annularis *Walk.*
viridis *Walk.*
annulipes *Walk.*
Scotica *Walk.*
ænea *Walk.*
tarsalis *Walk.*
nitidipes *Walk.*
breviventris *Walk.*
lugubris *Walk.*
tenuicornis *Walk.*
ovata *Walk.*
nitida *Walk.*
cinctipes *Walk.*
nigro-ænea *Walk.*
convexa *Walk.*
apicalis *Walk.*
tumida *Walk.*
tristis *Walk.*
dissimilis *Walk.*
semiaurata *Walk.*
costalis *Walk.*
philochortoides *Walk.*
cyanea *Walk.*
brevis *Walk.*
contigua *Walk.*
linearis *Walk.*
filicornis *Walk.*
femorata *Walk.*
MICROMELUS *Walk.*
rufo-maculatus *Walk.*
pyrrogaster *Hal.*
ISOCYRTUS *Walk.*
lætus *Walk.*

SPANIOPUS *Walk.*
dissimilis *Walk.*

APHIDIUS
PRAON *Hal.*
dorsalis *Hal.*
exoletus *Ess.*
volucris *Hal.*
flavinodis *Hal.*
abjectus *Hal.*
APHIDIUS
EPHEDRUS *Hal.*
validus *Hal.*
plagiator *Berl. Mag.*
lacertosus *Hal.*
APHIDIUS
TRIONYX *Hal.*
deltiger *Hal.*
APHIDIUS
MONOCTONUS *Hal.*
nervosus *Hal.*
Caricis *Hal.*
APHIDIUS
TRIONYS *Hal.*
luctus *Hal.*
pallidus *Hal.*
Angelicæ *Hal.*
Centaureæ *Hal.*
Aceris *Hal.*
Heraclei *Hal.*
letifer *Hal.*
minutus *Hal.*
brevicornis *Hal.*

TEPHRITIS *Latr.*
Alciphron *Newm.*
Theora *Newm.*
Alethe *Newm.*
Hebe *Newm.*
TRIXA *Meig.*
scutellata *Newm.*
CATOPS *Payk.*
nubifer *Newm.*
frater *Newm.*
soror *Newm.*
BYRRHUS *Lin.*
rufiventer *Newm.*
PHYLLOPERTHA *Kir.*
suturalis *Newm.*
ATHOUS *Esch.*
Campyloides *Newm.*
CYLINDERA *Newm.*
pallida *Newm.*
TRITOMACRUS *Newm.*
testaceus *Newm.*
SYMPETRUM *Newm.*
Scoticum *Lea.*
rufo-stigma *Newm.*
vulgatum *Lin.*
basale *Step.*
flaveolatum *Lin.*
CRABRO
bidens *Hal.*

END OF VOL. I.

R. CLAY, PRINTER, BREAD-STREET-HILL.

ERRATA.

ge 7, line 30, *for* anterior *read* posterior.
12, — 3 *from bottom, for* scutellum *read* scutum.
— — 2 *from bottom, for* scutum *read* scutellum.
38, — 19, *for* Escli *read* Esch.
— — 23, *for* 139, *read* 130.
39, — 2, *for* has *read* have.
63, — 16, *for* Epistoma *read* Episterna.
106, — 14, *for* shun *read* shew.
110, — 11 *from bottom, for* be *read* are.
— — 4 *from bottom, for* began *read* begun.
151, — 6 *from bottom, for* hedges *read* sedges.
161, — 16, *for* irrorata *read* guttata.
170, — 2 *from bottom, after* approximate *insert* :
176, — 6, *for* sides *read* grey colour of the sides.
220, — 2 *of note, for* compilations *read* compilation.
261, — 7, *before* 4-articulati *insert* ad summum.
262, — 21, *add as a synonym*, Microdus obscurator, *N.*
— — 23, *before* 5-articulati *insert* ad summum.
— — 25, *for* Adelius *read* Acælius.
— — 26, *for* radicales *read* radiales.
263, — 8, *read* A. Os breve. MICRODUS.
— — 12, *read* B. Os rostriforme. AGATHIS. Ag. malvacearum, *Lat.*
— — 13, 14, 15, 16, *erase entirely.*
— — 26, *read* CYANOPTERUS. Bracon flavator, *F.*
Br. denigrator, *E. B.*
264 — 24 and 26 *erase the words in parentheses.*
265 — *erase the last three lines.*
271 — 21, *for* 11-articulatæ *read* 12-articulatæ.
274 — 2, *for* 12-articulatæ *read* 13-articulatæ.
275 — 21, *for* 14-articulatæ *read* 13-articulatæ.
389 — 6 *from bottom, for* La Lepède *read* La Cepède.
417 — 10, 9, and 8, *from bottom, dele, being erroneous.*

Several other mistakes occur, most of them too obvious to need correction.

DIRECTIONS TO BINDER FOR PLACING THE PLATES.

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